OR, THE

LONDON AND NORTH-WESTERN RAILWAY

THE ELECTRIC TELEGRAPH,

AND

THE RAILWAY CLEARING-HOUSE.

BY THE AUTHOR OF

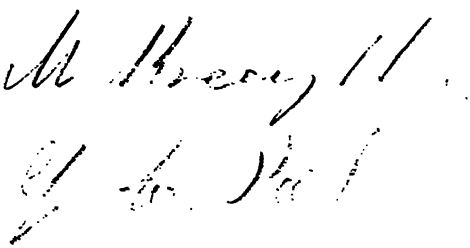
'BUBBLES FROM THE BRUNNEN OF NASSAU.'

Sir F. B. Head.

LONDON:

JOHN MURRAY, ALBEMARLE STREET.

1849.



WES and SONS, Stamford Street.

TO

RAILWAY TRAVELLERS,

AND

TO THE PROPRIETORS

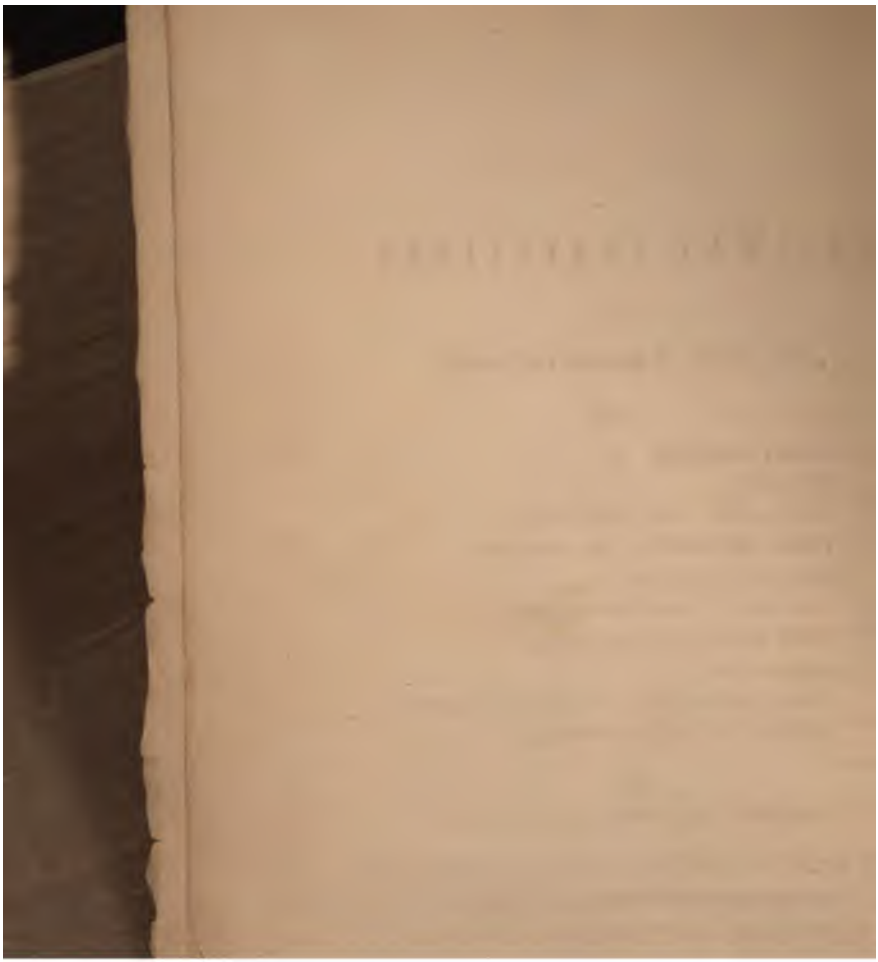
OF THE

GREAT WESTERN,
MIDLAND,
LANCASHIRE AND YORKSHIRE,
YORK, NEWCASTLE, AND BERWICK,
EASTERN COUNTIES,
LONDON AND SOUTH-WESTERN,
YORK AND NORTH MIDLAND,
CALEDONIAN,
GREAT SOUTHERN AND WESTERN (IRISH),
LONDON AND NORTH-WESTERN,

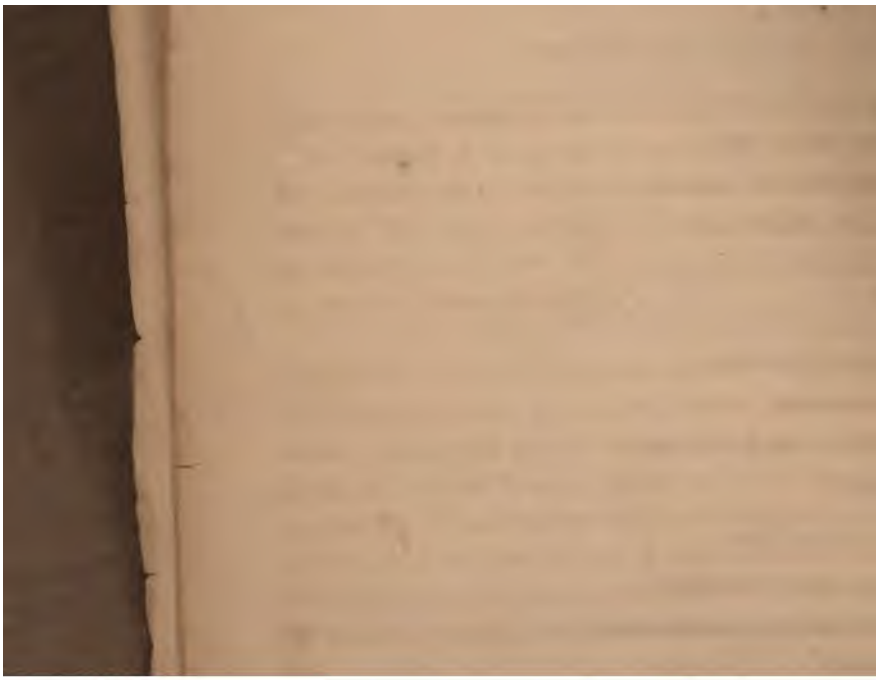
AND

OTHER BRITISH RAILWAYS,

THESE ROUGH SKETCHES, DELINEATING THE DIFFICULTIES
ATTENDANT UPON THE CONSTRUCTION,
MAINTENANCE, AND WORKING OF A RAILWAY,
ARE INSCRIBED.



CONTENTS.



INTRODUCTION.

A good many years ago, one of the toughest and hardest riders that ever crossed Leicestershire undertook to perform a feat which, just for the moment, attracted the general attention not only of the country but of the sporting world. His bet was, that, if he might choose his own turf, and if he might select as many thorough-bred horses as he liked, he would undertake to ride 200 miles in ten hours!!!

The newspapers of the day described exactly how "the Squire" was dressed—what he had been living on—how he looked—how, at the word "*Away!*" he started like an arrow from a bow—how gallantly Tranby, his favourite racer, stretched himself in his gallop—how, on arriving at his second horse, he vaulted from one saddle to another—how he then flew over the surface of the earth, if possible, faster than before—and how, to the astonishment and amidst the acclamations of thousands of spectators, he at last came in . . . a winner!

Now, if at this moment of his victory, while with dust and perspiration on his brow—his exhausted arms dangling just above the panting flanks of his horse, which his friends at each side of the bridle were slowly leading in triumph—a decrepit old woman had hobbled forward, and in the name of Science had

told the assembled multitude, that, before she became a skeleton, she and her husband would undertake, instead of 200 miles in ten hours, to go 500—that is to say, that, for every mile "the Squire" had just ridden, she and her old man would go two miles and a half—that she would moreover knit all the way, and that he should take his medicine every hour and read to her just as if they were at home; lastly, that they would undertake to perform their feat either in darkness or in daylight, in sunshine or in storm, "in thunder, lightning, or in rain;"—who, we ask, would have listened to the poor maniac?—and yet how wonderfully would her prediction have been now fulfilled! Nay, waggons of coals and heavy luggage now-a-days fly across Leicestershire faster and farther than Mr. Osbaldestone could go, notwithstanding his condition and that of all his horses.

When railways were first established, every living being gazed at a passing train with astonishment and fear: ploughmen held their breath; the loose horse galloped from it, and then, suddenly stopping, turned round, stared at it, and at last snorted aloud. But the "nine days' wonder" soon came to an end. As the train now flies through our verdant fields, the cattle grazing on each side do not even raise their heads to look at it; the timid sheep fears it no more than the wind; indeed, the hen-partridge, nning with her brood along the embankment of a deep cutting, not now even crouch as it passes close by her. It is the same nankind. On entering a railway station, we merely mutter rk in a box where we want to go—say "*How much?*"— horizontally poke a card into a little machine that it—receive our ticket—take our place—read our news- n reaching our terminus drive away perfectly careless of

all or of any one of the innumerable arrangements necessary for the astonishing luxury we have enjoyed.

On the practical working of a railway there is no book extant, nor any means open to the public of obtaining correct information on the subject.

Unwilling, therefore, to remain in this state of ignorance respecting the details of the greatest blessing which science has ever imparted to mankind, we determined to make a very short inspection of the practical machinery of one of our largest railways; and having, on application to the Secretary, as also to the Secretary of the Post-Office, been favoured with the slight authorities we required, without companion or attendant we effected our object; and although, under such circumstances, our unbiassed observations were necessarily superficial, we propose, first, to offer to our readers a faint outline of the difficulties attendant upon the construction and maintenance of a great railway, and then, by a few rough sketches, rapidly to pass in review some of the scenes illustrative of the practical working of the line, which we witnessed at the principal stations of the London and North-Western Railway—say EUSTON, CAMDEN, WOLVERTON, and CREWE.

LONDON AND NORTH-WESTERN RAILWAY.

CHAPTER I.

On the Construction of a Railway.

At the grand inauguration dinner eaten in Paris on the 28th of December, 1848, for the express purpose of celebrating the installation of the new President of the French Republic, it has been recorded by the reporters present, that among the numerous guests assembled, there was no one whose presence engrossed such universal attention as that of an erect emaciated member of "*La Vieille Garde.*"

The old soldier, it is stated, as he sat at table, scarcely noticed the constellations of bright, black, and hazel-coloured eyes that from all directions were concentrated upon him, but, addressing himself first to his own black bottle, and then with the utmost good humour to those of his neighbours, he drank and ate—drank—swigged—reflected,—and then, as if to refresh himself, drank again, again, and again, until, according to pre-arrangement, he stood up on the tribune to re-propose the health of "Louis Napoleon," to which—coupling the meteor now shining in its zenith with the "sun of Austerlitz," which, though sunk for ever below the horizon, still beamed as resplendently as ever within his heart—he added, with great naïveté, "Mais sans oublier l'autre!"

The French people, or rather the representatives of the French

nation who were assembled, had received the consecutive orations of several of the most illustrious of their fellow-citizens with considerable marks of approbation; but when the veteran in question, who was about seventy years of age, with hair white as snow, rose to address to them a short speech that would scarcely have filled his empty wine-glass, the sight of the uniform so dear to Frenchmen—the tall bear-skin cap, the crimson feather, blue coat, red facings, red worsted epaulettes, white breast, white breeches, long black gaiters reaching over the knee, and, above all, buttons with an eagle supporting the imperial crown—created a storm of applause which it would be utterly impossible to describe. For nearly a quarter of an hour shouts and clappings of hands prevented the old warrior from opening his lips, and the applause if possible increased when the veteran, with the palm of his hand turned outwards, stiffly saluted the company in correct martial style: and yet, strange to record, at the very moment of all this military enthusiasm, so characteristic of a nation of whom it was lately very eloquently stated "that it had been its ambition to be the world's guide and its destiny to be the world's warning," the French Government was not only without funds to protect public or private property, but, in fact, had nothing but the plunder of both to conciliate and feed the multitude of misguided and misguiding people who, by the ruin of commerce and by the stagnation of trade, were literally all over France starving from cold and hunger. Of their enthusiasm, therefore, as of that of the veteran standing up before them, it may truly be said or sung—

> "Happy 's the soldier that lives on his pay,
> And spends half-a-crown out of sixpence a-day!"

Having related, or rather merely repeated, this curious little anecdote, we will now endeavour to explain in what manner it applies to the subject of our chapter, namely, "*the construction of a railway.*"

It has been justly observed that "England is bound over to keep the peace by a national debt, or penalty, of 800 millions." During the glorious expenditure of all this money, the attention

of the country was solely engrossed with the art, employment, occupation, and victories of war. Our great statesmen were war-ministers—our great men were naval and military warriors of all ranks, whose noble bearing and gallant feats were joyfully announced, and, by universal acclamation, as gratefully rewarded; and if every man who took a government contract, or who in any way came into contact with government, easily made a large fortune by war, he, generally speaking, as rapidly spent it; and thus an artificial circulation of wealth was kept up, which, like the schoolboy's mode of warming himself, commonly called "beating the booby," produced a temporary glow, estimated at the moment to be of as much value as if it had naturally proceeded from the heart.

The English people during the period in question drank hard. The rule had scarcely an exception. As regularly as four o'clock P.M. struck, our noblemen, magistrates, judges, hunting squires, and country gentlemen, began to look a little flushed—the colour gradually increasing, until in due time they all became, like their sun in a fog, red in the face. Before bedtime the semi-rulers of the nation were half inebriated—some of our leading statesmen being, alas! notoriously, very nearly in the same state.

No sooner, however, were the British people, by the results of 1815, suddenly weaned from war, than their extraordinary natural powers, moral as well as physical, invigorated by comparative temperance, were directed to investigations, occupations, and studies which rapidly produced their own rewards. Indeed, without entering into details, the wealth which has been created and amassed since the period in question, added to that with which we have not only irrigated, but almost without metaphor top-dressed the greater portion of the old as well as of the new world, and, lastly, the extraordinary improvements that have taken place in light, heat, locomotion—electrical as well as by steam-power—machinery, in short in everything that administers to human comfort, form altogether the golden harvest of our labours; and thus, although to our eminent civil engineers considerable credit is due, they are, in fact, but secondary causes;

the engineer-in-chief—the primary inventor—the real constructor of our railways most indisputably being

THE GODDESS OF PEACE.

Send her victorious—happy and glorious—
Long to reign over us—God save that queen!

THE CONSTRUCTION OF THE LINE.

1. In considering the project of a railway, after fixing upon the two termini, it becomes necessary to select the towns through which it ought to pass.

2. When these have been determined, the chief engineer to whom the investigation of the proposed line has been confided, with the Ordnance map in his hand, walks and re-walks over the whole length (Mr. Robert Stephenson, in his investigation of the proposed line between London and Birmingham, walked upwards of twenty times over the country between each), until he feels that he carries in his mind the whole picture; and while he is thus imagining and making out various lines for consideration, his assistants are testing the eligibility of each by rapidly taking for him what are called "flying levels," as also "cross levels," along the principal ridges that at various angles intersect the proposed line, and yet, notwithstanding the accuracy of these mathematical precautions, it is almost invariably found that the eye of the chief engineer has intuitively selected the best line.

It is, however, as painful to reflect on, as it is humiliating to record, the prejudices, ignorance, passions, and artifice by which our principal engineers were opposed, or rather by which they were consecutively thwarted in the calm scientific investigations for the benefit of the public which we have just described.

Instead of a general desire on the part of the community to hail with gratitude, and to receive with open arms, an invention which was practically not only to enable them with double elbow-room, and at about half fares, to travel at four or five times the speed which by their utmost efforts they had previously been enabled to attain, but to afford similar facilities to millions of tons of manufactures and merchandize, much of which had

either been impeded by delay, or altogether clogged by the heavy charges on their transit, our engineers, in tracing the lines for our great arterial railways, were but too often looked upon as magicians, evil genii, or unclean spirits, whose unearthly object was to fright the land from its propriety.

In many instances where it was proposed, by tapping the dull stagnant population of a country town, to give vigour and animation to its system, the inhabitants actually fancied that their interests and their happiness would, like their habits, expire under the operation.

For example, it is well known that one of the results of Mr. R. Stephenson's deliberate investigations was, that the present London and North-Western Railway ought to pass through the healthy and handsome town of Northampton,—an arrangement which of course would instantaneously have given to it commercial importance of inestimable value. The inhabitants, however, urged and excited by men of influence and education, opposed the blessing with such barbarous force, that they succeeded, to their everlasting punishment, in distorting the line—*viâ* the Kilsby Tunnel, which, if the projected plan had been adopted, would not have been required—to a point five miles off! and if such ignorance could, in the nineteenth century, exist in a large and populous town, it cannot be a matter of surprise that our engineers should have had to encounter similar, or, if possible, still greater prejudices in rural districts.

It was there generally considered to be utterly incredible that a railway could ever possibly supersede our mail and stage coaches; at market meetings, and at market dinners, the invention was looked upon as, and declared to be, "a smoky substitute for canals;" and while men of property inveighed against its unsightly appearance, their tenants were equally opposed to the measure.

For instance, among the *reasons* for preventing the present London and North-Western Railway coming to Northampton, it was seriously urged by many very wealthy and respectable graziers in the neighbourhood, that the smoke of the passing

engines would seriously discolour the wool of their sheep; that the continual progress through their verdant meadows of a sort of rumbling, hissing, fiery serpent, would, by continually alarming, fretting, and distracting the attention of their cattle, prevent them, "poor things!" from fattening; in short, such was the opposition to the new system, that one of the engineers employed by the London and North-Western Railway to trace out a branch line (which, at a considerable expense to the Company, was to confer inestimable advantages upon its locality) was attacked by the proprietors of the soil, and a conflict or battle royal ensued, which ended in very serious legal results.

3. As soon as the chief engineer has, instead of the *best* line of railway that could have been determined on, decided on that which, for the *reasons* stated, it is *advisable* he should recommend —alas! what a pity it is that, in the construction of our great arterial railways, such a discreditable difference should have been allowed to exist!!—he employs his assistant engineers and surveyors to make for him accurate surveys, and to take correct sections, copies of which are to be deposited, according to Act of Parliament, with the various clerks of the peace of the several counties through which the line is to pass, with the Commissioners of Railways, &c. &c. &c.; besides which there is to be prepared for each parish its proportion, as also for every landholder a section, showing the greatest depth of cutting or embankment in any of his fields.

In addition to the collection and construction of all these data and drawings, notices are to be served upon every landowner, wherever he may be, in the United Kingdom; for which duty in 1845 almost everybody that could be picked up was engaged, the number of horses employed and *killed* in the operation having been utterly incalculable.

4. By the time these expenses have been incurred, the attention of the chief engineer is engrossed by a new struggle of vital importance, practically called "*the fight for the Act*," in both houses of Parliament.

As the question before the reader is abstractedly one of science, we gladly refrain from staining it by the slightest poli-

up shall as nearly as possible balance each other; in short, inasmuch as all contractors prudently, and indeed very properly, invariably lower their tenders in proportion as the work they are required to execute has been clearly laid open to their view, and, on the other hand, to secure themselves from unknown difficulties, as invariably *raise* their tenders for work which has not been sufficiently bored or examined, he is fully sensible that a considerable saving in the cost of the proposed railway will be effected by a clear preliminary development of its works.

6. This mass of information having been prepared, the chief engineer now advertises his work in its various lengths for execution by contract, and, on receiving tenders for the same, he selects, not always the *lowest*, but that which, for various reasons, is the most *approved*, taking security generally to the amount of 10 per cent. of the contract.

Previous, however, to the reception of the tenders the chief engineer appoints his staff of assistants. To each 40 or 50 miles there is usually appointed an experienced engineer, having under him "*sub-assistants*," who superintend from 10 to 15 miles each—these sub-assistants being again assisted by "*inspectors*" of masonry, of mining, of earth-work, and of permanent way, to each of whom a particular district is assigned.

7. The chief engineer now finds himself engaged in a new struggle with man in addition to nature. In many instances the contractors let out a portion of the work they have engaged to perform to sub-contractors, who again "set" the earth-work to a body of "navvies," who again among themselves sub-divide it among the three branches of which their State is composed, namely, "excavators," "trenchers," and "runners," each party of whom appoint their own "ganger."

The duty of effectually overlooking all these details, of preting collusion as well as collision, of enforcing the due exeon of the contract, and yet, where necessary, occasionally to viate the strict letter of its law, constitute perhaps the most assing of the various difficulties which the chief engineer has overcome: for it must be evident that if, by means of bribery, om inattention, or from sheer roguery, any important portion

of the work be "scamped," or insufficiently performed, results may ere long occur of the most serious description.

TUNNELS.

8. The brief history of the construction of the Kilsby Tunnel of the London and North-Western Railway very strikingly demonstrates the latent difficulties which occasionally evade the investigations, baffle the calculations, and which, by chastening as well as by humbling, eventually elevate the mind of every man of science who has practically to contend with the hidden secrets of the crust of the earth which we inhabit.

The proposed tunnel was to be driven about 160 feet below the surface. It was to be, as indeed it is, 2399 yards 2 feet 6 inches in length, with two shafts of the extraordinary size of 60 feet in diameter, not only to give air and ventilation, but to admit light enough to enable the engine-driver in passing through it with a train to see the rails from end to end.

In order correctly to ascertain, and honestly to make known to the contractors, the nature of the ground through which this great work was to pass, the engineer in chief sank the usual number of what are termed "trial shifts," and, it clearly appearing therefrom that the principal portion of the stratum was the shale of the lower oolite, the usual advertisements for tenders were issued, and the shafts, &c., having been minutely examined by the competing contractors, the work was let to one of them for the sum of 99,000*l.*

In order to drive the tunnel, it was deemed necessary to construct 18 working shafts, by which, like the heavings of a mole, the contents of the subterranean gallery were to be brought to the surface.

This interesting work was in busy progress, when all of a sudden it was ascertained, that at about 200 yards from the south end of the tunnel, there existed, overlaid by a bed of clay 40 feet thick, a hidden quicksand, which extended 400 yards into the proposed tunnel, and which the trial shafts on each side of it had almost miraculously just passed without touching.

The traveller in India could scarcely be more alarmed at the sudden sight of a crouching tiger before him, than the contractor was at the unexpected appearance of this invincible enemy. Overwhelmed at the discovery, he instantly took to his bed, and though he was liberally, or, to speak more correctly, justly relieved by the Company from his engagement, the reprieve came too late, for he actually died!

The question then arose whether, in the face of this tremendous difficulty, the execution of the Kilsby Tunnel should be continued or abandoned. The general opinion of the several eminent engineers who were consulted was against proceeding, and certainly the amount of the difficulties which were subsequently incurred, justified the verdict. But in science, as well as in war, the word "IM*possible*" can occasionally, by cool and extraordinary exertions, be divested of its first syllable; and accordingly, Mr. Robert Stephenson offering, after mature reflection, to undertake the responsibility of proceeding, he was duly authorised to do so.

His first operation was of course to endeavour by the power of steam-engines—the comrades of his life—to lower the water with which he had to contend; and although, to a certain degree, this attempt succeeded, yet by the draining of remote springs, and by the sinking of the water in wells at considerable distances, it was soon ascertained that the quicksand in question covered several square miles.

The tunnel, 30 feet high by 30 feet broad, arched at the top as well as the bottom, was formed of bricks laid in cement, and the bricklayers were progressing in "lengths" averaging 12 feet, when those who were nearest the quicksand, on driving into the roof, were suddenly almost overwhelmed by a deluge of water which burst in upon them. As it was evident that no time was to be lost, a gang of workmen, protected by the extreme power of the engines, were with their materials placed on a raft; and while, with the utmost celerity, they were completing the walls of that short length, the water, in spite of every effort to keep it down, rose with such rapidity, that at the conclusion of the work the men were so near being jammed against

moan of the rumbling train, or the occasional subterranean whistle of its engine; these noises being followed by the appearance of a slight smoke slowly meandering upwards from the two great shafts of the tunnel.

During the operations we have just described, an artificer who had been working in the tunnel was ascending one of the shafts when, the back of his coat happening to get into an angular crevice of the partition, called by miners a "*brattice*," which separated the shaft from the pumps, it became so completely jammed therein that the man was obliged to let go the rope, and accordingly, while dangling over his head it rose to the surface, he remained, to the utter astonishment and dismay of his comrades, suspended about 100 feet from the bottom, until some of them descended and rescued him by cutting away the imprisoned piece of his coat, which, on being afterwards extricated, was long preserved in the engineer's office as a trophy demonstrating the strength of good honest English broadcloth.

At the same shaft an accident of exactly a contrary nature subsequently occurred. In order to execute some trifling repair to the brattice, there was, during a desperate cold night, suspended, about half-way down the shaft, a temporary scaffolding on which several artificers were working by candle-light, when all of a sudden a well-known powerful "navvy," named Jack Pierson, fell from the surface with such momentum, that, breaking through the frail scaffolding as if it had been tinder, he was in a few seconds heard to go souse into the water at a considerable depth beneath!

As soon as the men on the scaffold had recovered from their surprise they naturally all at once were animated with a desire to save their comrade. One lustily roared out for rope; another vociferously proposed something else; while several navvies, bawling from the surface, were each as eagerly and as loudly prescribing his own remedy. In the midst of this confusion the stentorian voice of Jack Pierson himself was heard, from the very bottom of the pit, calmly to exclaim,

"DARM YOUR EYES, MAKE LESS NOISE AND POOL ME AROUT!!"

His rough command was instantly attended to, and he was moreover carried to his bed, where, poor fellow! he lay many weeks unable to move.

Besides the 1250 labourers employed in the construction of the tunnel, a proportionate number of suttlers and victuallers of all descriptions concentrated upon the village of Kilsby. In several houses there lodged in each room sixteen navvies, and as there were four beds in each apartment, two navvies were constantly in each; the two squads of eight men as alternately changing places with each other in their beds as in their work.

Such was the demand for lodging that it was, as we have stated, found necessary to construct a large village over the tunnel for the accommodation of the workmen, and, as they generally allowed themselves three meat meals a-day, it has been asserted that more beef was eaten at Kilsby during the construction of the tunnel than had previously been consumed there since the Deluge.

As these navigators are now before us, we trust that our readers will not only be curious but desirous to know a little more of the habits of a set of men who have lately added so materially to the prosperity of the country as well as to our luxuries, by the numerous railways which, by the honest sweat of their brows, they have one after another executed.

We need hardly say that, as regards their physical strength, they are the finest Herculean specimens of the British race; and, as is generally the case, in proportion as they are powerful so are they devoid of all bluster or bravado.

Those who have commanded large numbers of them state that they are not only obedient to all above them, even to their own "gangers," but that, although they have—we think very justly—occasionally required a permanent increase of pay, they have never meanly taken advantage of a press of business to strike for wages. Indeed the conduct of a "navvy," like his countenance, is honest and open. If from illness or misfortune he is unable to work, he and his family are maintained by his comrades; in truth the same provision is made among them for what are called by navvies their "*tally-wives*," a description of relationship exceedingly difficult *correctly to describe.*

As they earn high wages, it is a fashion among them to keep dogs; and as rather a noble trait, we may mention that there have been several instances where 10*l.* has been in vain offered to "a navvy" to induce him to sell his dumb favourite.

Generally speaking they are not addicted to poaching; but when not at work they usually amuse themselves by playing at skittles, at quoits, by drinking, and occasionally by fighting; and although the latter species of recreation is no doubt reprehensible, yet surely it is better for a man to walk homewards at night with a pair of black eyes and a bloody nose, than with an I O U cheque in his pocket for ten thousand pounds, gained by what the fashionable world terms "at *play*" from a companion whose wife he has made destitute, and whose children he has probably ruined!

At a navvy's funeral 500 of his comrades in their clean short white smock-frocks, with thin black handkerchiefs tied loosely round their throats, are seen occasionally in procession walking in pairs hand in hand after the coffin of their mate. In short, there exists among them a friendly "*esprit de corps*," which not only binds them together, but renders it rather dangerous for any stranger to cheat, or even to endeavour to overreach them.

During the construction of the present London and North-Western Railway, a landlady at Hillmorton, near Rugby, of very sharp practice, which she had imbibed in dealings for many years with canal boatmen, was constantly remarking aloud that no navvy should ever "*do*" her; and although the railway was in her immediate neighbourhood, and although the navvies were her principal customers, she took pleasure on every opportunity in repeating the invidious remark.

It had, however, one fine morning scarcely left her large, full-blown, rosy lips, when a fine-looking young fellow, walking up to her, carrying in both hands a huge stone bottle, commonly called "a grey-neck," briefly asked her for "half a gallon of gin;" which was no sooner measured and poured in than the money was rudely demanded before it could be taken away.

On the navvy declining to pay the exorbitant price asked, the

landlady, with a face like a peony, angrily told him he must either pay for the gin or *instantly* return it.

He silently chose the latter, and accordingly, while the eyes of his antagonist were wrathfully fixed upon his, he returned into her measure the half-gallon, and then quietly walked off; but having previously put into his grey-neck half a gallon of water, each party eventually found themselves in possession of half a gallon of gin and water; and, however either may have enjoyed the mixture, it is historically recorded at Hillmorton that the landlady was never again heard unnecessarily to boast "that no navvy could '*do*' her."

A navvy at Kilsby, being asked why he did not go to church? dully answered in geological language—"*Why, Soonday hasn't cropped out here yet!*" By which he meant that the clergyman appointed to the new village had not yet arrived.

The contrast which exists between the character of the French and English navigator may be briefly exemplified by the following trifling anecdote:—

In excavating a portion of the first tunnel east of Rouen towards Paris, a French miner dressed in his blouse, and an English "navvy" in his white smock jacket, were suddenly buried alive together by the falling in of the earth behind them. Notwithstanding the violent commotion which the intelligence of the accident excited above ground, Mr. Meek, the English engineer who was constructing the work, after having quietly measured the distance from the shaft to the sunken ground, satisfied himself that if the men, at the moment of the accident, were at the head of "the drift" at which they were working, they would be safe.

Accordingly, getting together as many French and English labourers as he could collect, he instantly commenced sinking a shaft, which was accomplished to the depth of 50 feet in the extraordinary short space of eleven hours, and the men were thus brought up to the surface alive.

The Frenchman, on reaching the top, suddenly rushing forwards, hugged and embraced on both cheeks his friends and acquaintances, many of whom had assembled, and then, almost

instantly overpowered by conflicting feelings,—by the recollection of the endless time he had been imprisoned—and by the joy of his release,—he sat down on a log of timber, and, putting both his hands before his face, he began to cry aloud most bitterly.

The English "navvy" sat himself down on the very same piece of timber—took his pit-cap off his head—slowly wiped with it the perspiration from his hair and face—and then, looking for some seconds into the hole or shaft close beside him through which he had been lifted, as if he were calculating the number of cubic yards that had been excavated, he quite coolly, in broad Lancashire dialect, said to the crowd of French and English who were staring at him as children and nursery-maids in our London Zoological Gardens stand gazing half terrified at the white bear,

"YAW'VE BEAN A DARMNATION SHORT TOIME ABAAOWT IT!"

In the construction of the London and North-Western Railway, the contractor at Blisworth also failed and also died.

Besides the perpendicular cutting which he had undertaken to execute, there was, on the surface of the rock through which it now passes, a stratum of about twenty feet of clay of so slippery a nature, that for a considerable time, in spite of all efforts or precautions, it continued to flow over into the cutting like porridge. The only remedy which could be applied was, at vast labour and expense, to remove this stratum for a considerable distance, terminating it by a slope at a very flat angle, all of which extra labour, trouble, and expense, we may observe, is not only unseen but unknown to the traveller, who, as he flies through the tunnel, if he looks at the summit at all, naturally fancies that it forms the upper extremity of the work.

In the construction of the tunnel at Walford an accident occurred of rather a serious nature. A mass of loose gravel concealed in the chalk, slipping *viâ* the shaft into the tunnel, suddenly killed eleven men, besides letting down from the surface a horse and gin.

Cuttings.

9. In passing through the consecutive cuttings of a great railway, the traveller usually considers that those through rock must have been desperate undertakings, infinitely more expensive than those through clay. The cost of both, however, is nearly equal; for, not only does the perpendicular rock-cutting require infinitely less excavation than the wide yawning earth one of the same depth, but when once executed the former is not liable to the expensive slips which subsequently occasionally afflict the latter.

In determining whether the line should proceed by tunnelling or by cutting, the engineer's rule usually is to prefer the latter for any depth less than sixty feet; after which it is generally cheaper to tunnel. If, however, earth be wanted for a neighbouring embankment, it becomes of course a matter of calculation whether it may not be cheaper to make a cutting instead of what abstractedly ought otherwise to have been a tunnel.

In the construction of the Tring cutting alone of the present London and North-Western Railway, there were excavated 1,297,763 cubic yards of chalk, of which about fifteen cubic feet weighed a ton.

Embankments.

10. Besides contending with water above ground as well as below, the constructor of a railway is occasionally assailed by an element of a very different nature. For instance, when the Wolverhampton embankment of the present London and North-Western Railway, at vast trouble and expense, was nearly finished, it was observed first to smoke, then get exceedingly hot, until a slow mouldering flame visible at night appeared. The bank began to consume away, and the heat continued until it actually burned the railway sleepers; at last, however, it exhausted itself. The combustion was caused by the quantity of sulphuret of iron or pyrites contained in the earth of the embankment, which, having been baked by the fire, will probably never slip.

11. It would be tedious, and indeed impossible, to detail the various works which a railway engineer has to superintend in the construction of the line, in the laying down of the rails or "permanent way," and in the subsequent, or rather simultaneous, erection of the various station-houses, storehouses, workshops, &c. &c., the interior of which we shall soon have occasion to enter.

An idea, however, of the magnitude of his operations may be faintly imparted by the following brief abstract of a series of calculations made by Mr. Lecount, one of the engineers employed in the construction of the southern division of the present London and North-Western Railway, and the writer of the article '*Railways*' in the 'Encyclopædia Britannica.' The great Pyramid of Egypt was, according to Diodorus Siculus, constructed by three hundred thousand—according to Herodotus by one hundred thousand—men; it required for its execution twenty years, and the labour expended on it has been estimated as equivalent to lifting 15,733,000,000 of cubic feet of stone one foot high. Now, if in the same manner the labour expended in constructing the Southern Division only of the present London and North-Western Railway be reduced to one common denomination, the result is 25,000,000,000 cubic feet of similar material lifted to the same height; being 9,267,000,000 of cubic feet *more* than was lifted for the pyramid; and yet the English work was performed by about 20,000 men only, in less than five years.

Again, it has been calculated by Mr. Lecount that the quantity of earth moved in the single division (112½ miles in length) of the railway in question would be sufficient to make a foot-path a foot high and a yard broad round the whole circumference of the earth! the *cost* of this division of the railway in penny-pieces being sufficient to form a copper kerb or edge to it. Supposing therefore the same proportionate quantity of earth to be moved in the 7150 miles of railway sanctioned by Parliament at the commencement of 1848 (*Vide* Parliamentary Returns), our engineers within about fifteen years would, in the construction of our railways alone, have removed earth sufficient to girdle the globe with a road one foot high and one hundred and ninety-one feet broad!

Abandoning, however, speculations of this nature, we will conclude our slight sketch of the principal works required for a railway by a few data, exemplifying the magnitude of the Britannia Bridge over the Menai Straits, the construction of which has been intrusted by its well-known inventor to the very able and experienced management of Mr. Frank Forster.

The dimensions of this straight wrought-iron aërial gallery, through which passengers and goods are to travel by rail, are—

Total length of bridge, divided into 4 openings— 2 of 230 feet 2 of 460 feet } each	Feet. In. 1834 9
Height of rails above high-water mark	104 0
Quantity of masonry in the towers and abutments .	1,365,000 cubic feet.
Weight of one of the iron tubes for the largest span, to be lifted 100 feet.	1,800 tons.
Value of each of the largest of the iron tubes, not including expense of raising it.	£54,000
The cost of the scaffolding now in use about the bridge has exceeded	£50,000

It would, we conceive, be impertinent to dilute the above facts by a single comment.

The Chief Engineer.

As the selection of an engineer-in-chief, competent to determine the best line for a projected railway to take, the mode in which it should be constructed, and, lastly, to execute his own project—deviating from it with consummate judgment according to the difficulties, physical, moral, and political, which, sometimes separately and sometimes collectively, suddenly rise up to oppose him—is a point not only of vital importance to the success of the undertaking, but in the undertaking is the *first* important point to be decided, it would, we were aware, have apparently been the most regular to have commenced the present chapter with this subject. We conceived, however, that instead of there detailing the qualifications necessary for the duties required, it would save us very many words, and our readers as much time, if we were to defer the consideration of that subject until a *brief* outline of

those duties should, without comment, practically explain the qualifications required.

If the United Kingdom had only projected the construction of one or two great arterial railways, we might naturally have expected that the few competent engineers necessary would readily have been obtained; but when we consider the number of railways that were simultaneously created, the surveys, plans, sections, and other preparations that were necessary, the magnitude of the works of various descriptions that were to be constructed in each, it must evidently to many be a subject of astonishment that there should have been found on the surface of our country not only the amount of engineering talent necessary for the execution of such vast works, but an amount which may truly be said to have exceeded the demand.

The curious historical fact, however, is, that the amount of engineering talent thus suddenly required existed not on *the surface* of our country, but, on the contrary, many hundred fathoms *beneath it.* The brilliant talents that were required were "black diamonds," without metaphor embedded in the bowels of the earth. Science called her spirits from the vasty deep, and in obedience to her commands there arose out of the shafts of our coaleries, and from beneath the bottom of the Thames—

OLD GEORGE STEPHENSON, who had served his articles of apprenticeship in a coal-mine, for many years working at the engines both above ground and below;

ISAMBARD BRUNEL, whose principal experience had been acquired in the construction of the Thames Tunnel;

JOSEPH LOCKE, a colliery-viewer, who had served his apprenticeship below ground;

ROBERT STEPHENSON, brought up as a coal-miner, served his apprenticeship at Killingworth colliery;

FRANK FORSTER had worked for seven years as an apprentice in a coal-mine;

NICHOLAS WOOD, ditto;

CHARLES LEAN, ditto;

And a crowd of similar genii, all slaves of the same lamp, or "*Old Davy*," as they term it.

To such men the difficulties attendant upon the construction of a railway were trifling as compared with those against which all their lives they had been contending.

For instance, he who along dark, intricate, subterranean passages, or "heavings," as they are termed, often only three feet and a half high, and occasionally only two feet high, creeping and crawling through foul air, could with great speed, not only with unerring certainty find his way, but in such a secluded study could plan a variety of new cuttings, each forming part and parcel of a reticulated system of excavation which an unpractised mind would find it utterly impossible to comprehend, would, it may easily be conceived, experience but little difficulty, when walking erect in sunshine and in balmy air, to carry in his mind from, say Harrow to Watford, Watford to Tring, Tring to Wolverton, and Wolverton to Birmingham, those great leading features of the surrounding country which would enable him to exercise for the laying out of a railway the judgment and decision required.

Again, what, it may justly be asked, are embankments, deep cuttings, and occasionally here and there a straight tunnel thirty feet broad, twenty-seven feet high, *usually forming by drainage its own adit*, in comparison with the overwhelming and intricate difficulties attendant upon—

1st. The excavation of coal from strata of various characters, at various depths, each passage or "air-heaving" requiring perhaps a different system of support.

2nd. Encountering at various depths quicksands.

3rd. The great as well as minute arrangements necessary for wheeling carriages and raising the coals.

4th. The organization and management of a subterranean army of men and horses.

5th, and lastly. Lifting by steam-power from various depths, by night and by day, streams, floods, and occasionally almost rivers of water?

It has been beneath the surface of our country that these and many other difficulties of vast magnitude—unknown to and unthought of by the multitude—*have for many* generations been

successfully encountered by science, capital, and by almost superhuman physical exertion; and it was accordingly, as we have stated, from beneath the surface of Great Britain that an organised corps of civil engineers, who, like those we have named, had regularly served as apprentices, arose, in the emergency of a moment, to assist their eminent brother engineers above ground, in constructing for the country the innumerable railways so suddenly required.

CHAPTER II.

On the Maintenance of the Permanent Way.

As soon as an infant railway can run alone—we mean as soon as its works are all constructed, its permanent way finished, its buildings executed, its locomotive engines as well as its carriages constructed, and its whole establishment of officers and men appointed and organised—the chief engineer, like a month-nurse, usually departs to new troubles, leaving the maintenance of the way to those of his assistants whom he considers, and who in the opinion of the Directors of the Company are deemed, the most competent to execute its various details.

The manner in which this important duty is performed on the London and North-Western Railway is very briefly as follows:—

The line is, according to the nature of its works, divided into distances of from 17 to 30 miles, to each of which there is appointed "*an overlooker*," whose district is subdivided into "lengths" of one or two miles, to each of which is appointed "*a foreman*," with his gang of two or three men.

Every morning before the first train passes, the foreman is required to walk over his length, not only generally to inspect it, but especially to ascertain that each of the wooden keys which secure the rails are firmly fixed; and in case of any deficiency, his first operation is to put up, 800 yards above the point, a signal flag, which flies until the necessary repair is executed.

The ambition of the superintendent of the division is, however, to execute all necessary repairs not only with the utmost promptitude and despatch, but, if possible, without impeding the passage of the public; and considering the number of up and down passenger, goods, and coal trains (vide 'Bradshaw's List') that are continually passing along the line, the success with which this object can, in railway management, be practically attained is worthy of explanation. For instance—

1. In February, 1848, three miles of single rails were relaid by the Company's engineer in Kilsby Tunnel; 125 men and one ballast-engine being employed in this work for four weeks, without stopping the public.

2. The Beech Wood Tunnel (situated about five miles north of Coventry, and about 300 yards in length) was entirely relined with bricks. Two hundred workmen were employed in this troublesome operation for about six weeks without a single accident, and without stopping the public, who, indeed, probably, during the whole period of the repair, passed through without being even aware of the execution of the job.

3. Between June, 1845, and October, 1848, the Company's engineer of the Southern District relaid 57 miles of single line of railway without stopping a train and without accident.

At the Agricultural Meeting at Northampton in July, 1847, upwards of 11,000 persons were sent to Northampton, and 13,000 returned in the evening, the carriages they occupied forming one mass as far as the eye could reach. From the Company's returns it appears that, of the above number, not a single person received any injury; and although, from some unaccountable reason, a good many of them on their return walked, it is whispered, zigzaggedly, only two out of the whole number were despatched to wrong destinations.

As the above facts require no comment, it is merely necessary to explain by what description of arrangements the works of a great railway can be repaired and renewed without stopping the public.

The two following specimens of the directions issued on such occasions by the Company's superintendent will best give the information required:—

LONDON AND NORTH-WESTERN RAILWAY.

Superintendent's Office, Euston Station,
22nd January, 1848.

RELAYING THE RAILS IN THE KILSBY TUNNEL.

The Engineer Department have given notice that the workmen are ready to commence removing the stone blocks and relaying the rails in the Kilsby Tunnel.

The Electric Telegraph having been laid through the Tunnel, the

work is to commence on the night of Wednesday the 2nd of February, and during its continuance the traffic is to be conveyed over one Line from the passing of the Up Lancashire Express Train (say 9 P.M.) until 8 o'clock the following morning, when the Up Line is to be clear for the passage of the 7 A.M. Train from Birmingham.

The passage of the Trains through the Tunnel during the night is to be under the following regulations:—

The *Red* Signal is to be kept on at each entrance to the Tunnel during the hours the traffic has to pass over the same Line; and every Train, whether Up or Down, is to stop short of the Cross Road laid down at the Tunnel mouth.

As a guide to the Drivers where to stop, a Post has been erected, upon which a Red Light will be shown, and beyond which the Engine is not to advance.

As a further precaution during the hours of relaying, the *Green* Signal is to be shown at Crick, and by the Policeman stationed at Hillmorton Ballast Pit, as notice to the Drivers in either direction to shut off the steam.

On the approach of a Train to either entrance, the Policeman on duty is to sound the Telegraph Bell, whereupon the Policeman at the other end will respond by sounding his Bell; and immediately after telegraph "*Line clear*," or "*Line blocked*," as the case may be.

If the answer be "*Line clear*," the Train is to be allowed to enter the Tunnel, the Policeman at the entrance telegraphing back to the other end "*Train in*," whereupon he will not again telegraph, or allow any Engine to enter the Tunnel, until he receives Telegraph Notice from the other end "*Train out*."

The same process and precaution is to be observed with every Train that may arrive, and no Signal is to be considered received and understood until responded to.

Whichever end first rings the bell to announce the approach of a Train, that Train is to have the precedence, and a Train arriving at the other end is to be kept clear of the Crossing Points until the first announced Train has passed, when, after telegraphing "*Train out*," and getting the response from the other end, the Policeman at that end will ring his bell as notice that he has a Train waiting to enter, which is to be allowed to proceed after passing the Signals as before described.

Three Policemen are also to be stationed in the Tunnel with Fog Signals and Hand Lamps, to signal the Trains as they pass through; and one additional at each entrance, to assist in the Signals and crossing the Trains.

The Drivers are to be strictly enjoined to approach the Tunnel with caution, as a Train may be standing outside, and on passing through they are to be prepared to bring their Train to a stand, should it be necessary to stop unexpectedly.

H. P. BRUYERES.

LONDON AND NORTH-WESTERN RAILWAY.

Superintendent's Office, Euston Station,
30th August, 1848.

RELAYING OF THE UP LINE BETWEEN BERKHAMPSTEAD AND TRING.

The Engineer Department have notified that they are prepared to relay a portion of the Up Line, between the 27¾ and 30 Mile Posts, north of Berkhampstead Station.

The plate-layers are to work at the undermentioned times, viz. :—

From 3.50 A.M. to 5.40 A.M.

That is, after the passing of the 12.15 Night Mail Passenger Train from Birmingham, until the 2.0 A.M. Goods Train from Rugby becomes due. Again—

From 7.50 A.M. to 8.55 A.M.

That is, after the passing of the 6.45 A.M. Wolverton Passenger Train, until the 7.15 A.M. Passenger Train from Northampton becomes due. Again—

From 9.55 A.M. to 10.50 AM.

That is, after the passing of the 7.0 A.M. Passenger Train from Birmingham, until the 9.45 A.M. Passenger Train from Bedford becomes due. Again—

From 12.40 Noon to 1.50 P.M.

That is, after the passing of the 10.35 Goods Train from Wolverton, until the 10.30 A.M. Passenger Train from Birmingham becomes due, when the relaying will cease for the day.

The interval from 12.40 Noon to 1.50 P.M. for relaying will be allowed daily, except on Thursdays and Saturdays, on which days, in consequence of the Up Special Cattle Trains, the relaying is to cease after the third interval, viz. at 10.50 A.M.

Although all the Up Trains will travel on their own line, should any arrive out of course during the hours the Relaying Party are engaged, they are not to proceed forward on their journey until advised by the Policeman engaged with the Workmen that the Line is ready for their passage.

Until the relaying be reported complete, the Drivers and Guards of

all Up Trains are to be instructed before leaving Wolverton that they are to be in readiness to stop on the instant the Policeman engaged with the Working Party signals them to do so.

A Policeman is to be specially appointed to attend the Working Party, and stop any Train should it be necessary.

The work to commence on Friday next, the 1st of September.

No Pilot Engine is to be allowed to leave Tring on its return to London during the time of the four intervals allotted to the Relaying Party.

(Signed) H. P. BRUYERES.

In cases of slips of embankments or other heavy accidents of any description, the Company's engineer is prepared to collect and forward to the spot with the utmost possible despatch the amount of men and materials required.

Having concluded a very faint outline of the difficulties attendant upon the construction of a great railway, and upon the maintenance of its permanent way, we will now proceed very briefly to describe the practical working of the whole concern.

CHAPTER III.

THE TRAINS—EUSTON.

The Down Train.

ON arriving in a cab at the Euston Station, the old-fashioned traveller is at first disposed to be exceedingly pleased at the new-born civility with which, the instant the vehicle stops, a porter, opening its door with surprising alacrity, most obligingly takes out every article of his luggage; but so soon as he suddenly finds out that the officious green straight-buttoned-up official's object has been solely to get the cab off the premises, in order to allow the string of variegated carriages that are slowly following to advance—in short, that, while he has been paying to the driver, say only two shining shillings, his favourite great-coat, his umbrella, portmanteau, carpet-bag, Russia leather writing-case, secured by Chubb's patent lock, have all vanished—he poignantly feels, like poor Johnson, that his "patron has encumbered him with help;" and it having been the golden maxim of his life never to lose sight of his luggage, it gravels and dyspepsias him beyond description to be civilly told that on no account can he be allowed to follow it, but that "*he will find it on the platform;*" and truly enough the prophecy is fulfilled; for there he does find it on a barrow in charge of the very harlequin who hipped away, and who, as its guardian angel, hastily muttering e words "*Now then, Sir!*" stands beckoning him to advance.

The picture of the departure of one of the large trains from ie Station at Euston Square, however often it may have been witnessed, is worthy of a few moments' contemplation.

On that great covered platform, which, with others adjoining it, is lighted from above by 8797 square yards (upwards of an

acre and three-quarters) of plate-glass, are to be seen congregated and moving to and fro in all directions, in a sort of Babel confusion, persons of all countries, of all religions, and of all languages. People of high character, of low character, of no character at all. Infants just beginning life—old people just ending it. Many desirous to be noticed—many, from innumerable reasons, good, bad, and indifferent, anxious to escape notice. Some are looking for their friends—some, suddenly turning upon their heels, are evidently avoiding their acquaintance.

Contrasted with that variety of free and easy well-worn costumes in which quiet-minded people usually travel, are occasionally to be seen a young couple—each, like a new-born baby, dressed from head to foot in everything perfectly new—hurrying towards a coupé, on whose door there negligently hangs a black board—upon which there is printed, not unappropriately, in white bridal letters, the word "ENGAGED."

Across this mass of human beings a number of porters are to be seen carrying and tortuously wheeling, in contrary directions, baggage and property of all shapes and sizes. One is carrying over his right shoulder a matted parcel, 12 or 15 feet long, of young trees, which the owner, who has just purchased them for his garden, is following with almost parental solicitude. Another porter, leaning as well as walking backwards, is attempting with his whole strength to drag towards the luggage-van a leash of pointer-dogs, whose tails, like certain other "tails" that we know of, are obstinately radiating from the couples that bind together their heads: while a number of newspaper-vendors, "fleet-footed Mercuries," are worming their way through the crowd.

Within the long and apparently endless straight line of railway carriages which bound the platform, are soon seen the faces and caps of various travellers, especially old ones, who with due precaution have taken possession of their seats; and while most of these, each of them with their newspapers unfolded on their knees, are slowly wiping their spectacles, several of the younger inmates are either talking to other idlers leaning on their carriage-windows, or, half kissing and half waving their hands, are

bidding "farewell" to the kind friends who had accompanied them to the station.

Some months ago, at a crisis similar to that just mentioned, we happened to be ensconced in the far corner of a railway carriage, when we heard a well-known clergyman from Brighton suddenly observe to his next neighbour who sat between us, "*There must surely be something very remarkable in that scene!*" His friend, who was busily cutting open his *Record*, made no reply, but, as we chanced to witness the trifling occurrence alluded to, we will very briefly describe it. A young man of about twenty-two, of very ordinary height, dress, and appearance, was standing opposite to a first-class carriage just as the driver's whistle shrilly announced the immediate departure of the train. At this signal, without any theatrical movement, or affectation of any sort, he quietly reeled backwards upon a baggage-truck, which happened to be immediately behind him. Two elderly ladies beside him instantly set to work, first of all, most vigorously to rub with their lean fingers the palms of his hands—they might just as well have scrubbed the soles of his boots;—then they untied his neckcloth; but their affectionate kindness was of no avail. The train was probably separating him from something, or from some one. The movement however he had not witnessed, for the mere whistle of the engine had caused him to swoon! What corresponding effect of fainting or sobbing it may have produced on any inmate in that carriage before which he had long been standing, and which had just left him, we have no power to divine. It is impossible, however, to help reflecting what a variety of emotions must every day be excited within the train as well as on the platform at Euston Station by the scream or parting whistle which we have just described. From the murderer flying from the terrors of justice down to the poor brokenhearted creditor absconding from his misfortunes;—from our careworn Prime Minister down to the most indolent member of either House of Parliament—each simultaneously escaping after a long-protracted session;—from people of all classes going from or to laborious occupation, down to the schoolboy reluctantly returning to, or joyfully leaving, his

school;—from our Governor-General proceeding to embark for India, down to the poor emigrant about to sail from the same port to Australia—the railway-whistle, however unheeded by the multitude, must oftentimes have excited a variety of feelings which it would be utterly impossible to describe.

While the travellers of a train are peacefully taking their seats, artillery-men, horses, and cannon, on a contiguous set of rails, are occasionally as quietly embarking in carriages, horse-boxes, and trucks, which are subsequently hooked on to a mass of passengers perfectly unconscious of the elements of war which are accompanying them.

As a departing railway-train, like a vessel sailing out of harbour, proceeds on its course, its rate rapidly increases, until, in a very short time, it has attained its full speed, and men of business are then intently reading the "City news," and men of pleasure the leading article of their respective newspapers, when this runaway street of passengers—men, women, and children—unexpectedly find themselves in sudden darkness, visible only by a feeble and hitherto unappreciated lamp, which, like the pale moon after a fiery sunset, modestly shines over their head. By this time the boarded platform at Euston Station, but a few minutes ago so densely thronged with passengers, is completely deserted. The lonely guard on duty, every footstep resounding as he walks, paces along it like a sentinel. The newspaper-vendors, sick untó death of the news they had been vaunting, are indolently reclining at their stalls; even the boy who sells 'Punch' is half asleep; and there is nothing to break the sober dulness of the scene but a few clerks and messengers, who, like rabbits popping from one hole of their warren into another, enter upon the platform from the door of one office to hurry into that of the next. In a few minutes, however, the loud puffing of an engine announces the approach towards the platform of a string of empty carriages, which are scarcely formed into the next departure train, when vehicles of all descriptions are again to be seen in our most public thoroughfares concentrating upon the focus of Euston Square; and thus, with a certain alleviation on Sundays, this strange feverish admixture of confusion and quiet-

ness, of society and solitude, continues intermittently from ½ past 6 A.M. to 10 P.M. during every day in the week, every week in the month, and every month in the year.

The Up Train.

The out-train having been despatched, we must now beg our readers to be so good as to walk, or rather to scramble, with us from the scene of its departure across five sets of rails, on which are lying, like vessels at anchor in a harbour, crowds of railway-carriages preparing to depart, to the opposite platform, in order to witness the arrival of an incoming train. This platform, for reasons which will shortly appear, is infinitely longer than that for the departure trains. It is a curve 900 feet in length, lighted by day from above with plate-glass, and at night by 67 large gas-lamps suspended from above, or affixed to the iron pillars that support the metallic net-worked roof. Upon this extensive platform scarcely a human being is now to be seen; nevertheless along its whole length it is bounded on the off-side by an interminable line of cabs, intermixed with private carriages of all shapes, gigs, dog-carts, and omnibuses, the latter standing opposite to little ugly black-faced projecting boards, which by night as well as by day are always monotonously exclaiming, "*Holborn—Fleet Street—and Cheapside!*"—"*Oxford Street—Regent Street—and Charing Cross!*" *&c.*

In this motley range of vehicles, smart coachmen, tall pale powdered footmen, and splendid horses are strangely contrasted with the humble but infinitely faster conveyance—the common cab. Most of the drivers of these useful machines, strange to say, are absent; the remainder are either lolling on benches, or, in various attitudes, dozing on their boxes. Their horses, which are generally well-bred, and whose bent knees and fired hocks proclaim the good services they have performed, stand ruminating with a piece of sacking across their loins, or with nose-bags, often empty—until for some reason a carriage before them leaves their line: in which case, notwithstanding the absence of their drivers and regardless of all noises, they quietly advance along the edge of the little precipice which bounds the rails.

They there know quite well what they are waiting for, and have no desire to move. Indeed, it is a Pickwickian fact, well known to cab-drivers, that their horses travel unwillingly from the station, but always pull hard coming back, simply because it is during the waiting-time at Euston Station that their nose-bags are put on—or, in other words, that they are fed.

We may here observe that there are sixty-five selected cabmen who have the *entrée* to the platform, and who, *quamdiù se bene gesserint*, are allowed exclusively to work for the Company, whose name is painted on their cabs. If more than these are required, a porter calls them from a line of supplicant cabs standing in the adjacent street. Close to each departure-gate there is stationed a person whose duty it is to write down in a book the number of each cabman carrying away a passenger, as well as the place to which he is conveying him, which two facts each driver is required to exclaim as he trots by; and thus any traveller desirous to complain of a cabman, or who may have left any property in a carriage from Euston Station, has only to state on what day and by what train he arrived, also whither he was conveyed, and from these data the driver's name can at any lapse of time be readily ascertained.

But our attention is suddenly claimed by something of infinitely more importance than a passenger's luggage: for that low unearthly whine within the small signal-office behind the line of cabs and carriages requires immediate explanation.

The variety of unforeseen accidents that might occur by the unwelcome arrival of an unexpected or even of an expected passenger-train at the great terminus of the London and North-Western Railway are so obvious that it has been deemed necessary to take the following precautions.

As soon as the reeking engine-funnel of an up-train is seen darting out of the tunnel at Primrose Hill, one of the Company's servants stationed there, who deals solely in compressed air—or rather, who has an hydraulic machine for condensing it—allows a portion to rush through an inch iron pipe; and he thus instantaneously produces in the little signal-office on the up-platform of Euston Station, where there is always a signal-man watching

by night as well as by day, that loud melancholy whine which has just arrested our attention, and which will continue to moan uninterruptedly for five minutes:—

"Hic vasto rex Æolus antro
Luctantes ventos tempestatesque sonoras
Imperio premit, ac vinclis et carcere frenat.
Illi indignantes magno cum murmure fremunt."

The moment this doleful intimation arrives, the signal-man, emerging from his little office, touches the trigger of a bell outside his door, which immediately in two loud hurried notes announces to all whom it may concern the arrival at Camden Station of the expected up-train; and at this moment it is interesting to watch the poor cab-horses, who, by various small muscular movements, which any one acquainted with horses can readily interpret, clearly indicate that they are perfectly sensible of what has just occurred, and quite as clearly foresee what will very shortly happen to them.

As soon as the green signal-man has created this sensation among bipeds and quadrupeds, taking with him the three flags, of danger (red), caution (green), and security (white), he proceeds down the line a few yards to a point from which he can plainly see his brother signal-man stationed at the mouth of the Euston tunnel. If any obstruction exists in that direction, the waving of the red flag informs him of it; and it is not until the white one from the tunnel as well as that from the station-master on the platform have reported to him that "all is clear" that he returns to his important but humble office (12 feet in length by 9 in breadth) to announce, by means of his compressed-air apparatus, this intelligence to the ticket-collector at Camden Station, whose strict orders are, on no account whatever to allow a train to leave his platform until he has received through the air-pipes, the signal-office at Euston Station, the Company's lugu- authority to do so.

he latter office there are also the dial and wires of an c telegraph, at present inoperative. The signal-man, how- mentioned to us the following trifling anecdote, as illus-

trative of the practical utility of that wonderful invention, which has so justly immortalized the names of Cooke and Wheatstone. An old general officer, who, from his residence some miles beyond Manchester, had come up to Euston Station on an invitation from the East-India Directors to be present at the dinner to be given by them to Lord Hardinge, found on his arrival that it would be necessary he should appear in regimentals: and the veteran, nothing daunted, was proposing to return to Manchester, when the signal-man at Euston advised him to apply for them by electric telegraph. He did so. The application, at the ordinary rate of 280,000 miles (about twelve times the circumference of the earth) *per second*, flew to Manchester; in obedience to its commands a porter was instantly despatched into the country for the clothes, which, being forwarded by the express train, arrived in abundant time for the dinner. The charge for telegraph and porter was 13*s*. 8*d*.

About four minutes after the up-train has been authorised by the air-pipe to leave Camden Station, the guard who stands listening for it at the Euston tunnel, just as a deaf man puts his ear to a trumpet, announces by his flag its immediate approach; on which the signal-man at the little office on Euston platform again touches his trigger, which violently convulsing his bell as before, the cab-horses begin to move their feet, raise their jaded heads, prick up their ears, and champ their bits; the servants in livery turn their powdered heads round; the Company's porters, emerging from various points, quickly advance to their respective stations; and this suspense continues until in a second or two there is seen darting out of the tunnel, like a serpent from its hole, the long dark-coloured dusty train, which, by a tortuous movement, is apparently advancing at its full speed. But the bank-riders, by applying their breaks—without which the engineless train merely by its own gravity would have descended the incline from Camden Station at the rate of forty miles an hour —soon slacken its speed, until the Company's porters at a brisk walk are preparing to unfasten one after another the doors of all the carriages.

While they are performing this popular duty, numerous salu-

tations, and kissings of hands of all colours and sizes, are seen to pass between several of the inmates of the passing train and those seated in or on the motley line of conveyances standing stock still which have been awaiting their arrival. A wife suddenly recognises her husband, a mother her four children, a sister her two dear brothers; Lord A. B. politely bows to Lady C. D.; John, from his remote coach-box, grins with honest joy as faithful Susan glides by; while Sally bashfully smiles at "a gentleman" in plush breeches reclining in the rumble of the barouche behind it.

As soon as the train stops, a general "sauve qui peut" movement takes place, and our readers have now an opportunity of observing that, just as it is hard to *make* money, easy to spend it, so, although it consumes at least twenty minutes to fill and despatch a long train, it scarcely requires as many seconds to empty one. Indeed, in less than that short space of time the greater number of the railway carriages are often empty!

When every person has succeeded in liberating himself or herself from the train, it is amusing to observe how cleverly, from long practice, the Company's porters understood the apparent confusion which exists. To people wishing to embrace their friends—to gentlemen and servants darting in various directions straight across the platform to secure a cab or in search of private carriages—they offer no assistance whatever, well knowing that none is required. But to every passenger whom they perceive to be either restlessly moving backwards and forwards, or standing still, looking upwards in despair, they civilly say "*This way, Sir!*" "*Here it is, Ma'am!*"—and thus, knowing what they want before they ask, they conduct them either to the particular carriage on whose roof their baggage has been placed, or to the luggage-van in front of the train, from which it has already been unloaded on to the platform; and thus, in a very few minutes after the convulsive shaking of hands and the feverish distribution of baggage have subdivided, all the cabs and carriages have radiated away—the parti-coloured omnibuses have followed them—even the horses, which in different clothing have been disembarked, have been led or ridden away—and, the foot-

passengers having also disappeared, the long platform of the incoming train of the Euston Station remains once more solely occupied by one or two servants of the Company, hemmed in by a new line of expectant cabs and omnibuses. Indeed, at various periods of the day, a very few minutes only elapse before, at the instigation of compressed air, the faithful signal-bell is again heard hysterically announcing the arrival of another train at Camden Station.

In a clear winter's night the arrival of an up-train at the platform before us forms a very interesting picture.

No sound is heard in the cold air but the hissing of a pilot engine, which, like a restless spirit advancing and retrograding, is stealing along the intermediate rails, waiting to carry off the next down-train; its course being marked by white steam meandering above it and by red-hot coals of different sizes which are continually falling from beneath it. In this obscure scene the Company's interminable lines of gaslights (there are 232 at the Euston Station), economically screwed down to the minimum of existence, are feebly illuminating the damp varnished panels of the line of carriages in waiting, the brass doorhandles of the cabs, the shining haims, brass browbands and other ornaments on the drooping heads and motionless backs of the cab-horses; and while the blood-red signal lamp is glaring near the tunnel to deter unauthorised intrusion, the stars of heaven cast a faint silvery light through the long strips of plate-glass in the roof above the platform. On a sudden is heard—the stranger hardly knows whence—the mysterious moan of compressed air, followed by the violent ringing of a bell. That instant every gaslight on and above a curve of 900 feet suddenly bursts into full power. The carriages, cabs, &c. appear, comparatively speaking, in broad daylight, and the beautiful iron reticulation which sustains the glazed roof appears like fairy work.

CHAPTER IV.

The Railway Carriages.

We will now proceed to detail a few circumstances respecting the railway carriages, about which our readers have probably never cared to inquire.—And, *firstly*, as soon as an up-train arrives at the commencement of the Euston platform, while it is still in motion, and before its guard—distinguished by a silver-buckled black shiny patent-leather belt, hanging diagonally across the white buttons of his green uniform-coat—has ventured with practised skill to spring from the sideboard of the train to the platform, two greasy-faced men in canvas jackets, with an oil-can in each of their right hands and with something like a mophead of dirty cotton hugged under each of their left arms, are to be seen running on each side of the rails below in pursuit of the train; and while the porters, holding the handles of the carriage doors, to prevent any traveller from escaping, are still advancing at a brisk walk, these two oilmen, who have now overtaken the train, diligently wipe as they proceed the dust and perspiration from the buffer-rods of the last carriage. As soon as these irons are perfectly clean and dry rubbed, they oil them from their can; and then—crawling beneath the open doors of the carriages and beneath the feet and ankles of a crowd of exuding travellers of all ages, who care no more for oilmen than the oilmen of this world care for them—they hurry to the buffer-rods of the next carriage—and so rapidly do they proceed, that before the last omnibus has driven off, the buffer-rods of the whole train are as bright as when new. But, *secondly*, these two men have been closely followed by two others in green jackets—one on each side of the carriage—who deal solely in a yellow composition of tallow and palm-oil. Carrying a wooden box full of this ointment in one hand and a sort of short flat salve-knife in the other,

they open with the latter the small iron trap-doors which cover the receptacles for greasing the axles, restore whatever quantity has been exhausted, and then, closing with a dexterous snap the little unctuous chamber over which they preside, they proceed to the next tallow-box; and thus, while the buffer-rods of the whole train are being comfortably cleaned and greased, the glistening axles of the carriages are simultaneously fed with luxurious fat. *Thirdly*, while these two operations are proceeding in the lower region, at about the same rate two others are progressing, one inside the carriages and the other on their roofs; for on the arrival of every passenger-train, the carriage "*searcher*," also "beginning at the end," enters every carriage, lifts up first all the stuffed blue seats, next the carpet, which he drops in a heap in the middle of the carriage, and then, inquisitively peeping under the two seats, he leaves the carriage, laden with whatever article or articles may have been left in it, to continue his search throughout the train. The inconceivable number and variety of the articles which he collects we shall shortly have occasion to notice. *Fourthly*, above the searcher's head, on the roof, and following him very closely in his course, there "sits up aloft" a man called a "*strapper*," whose sole duty it is, on the arrival of every train, to inspect, clean, shampoo, and refresh with cold-drawn neat's-foot oil the luggage-straps, which, in consequence of several serious accidents that have occurred from their breaking, are now lined inside with strong iron wire. It is the especial duty of this inquisitor to condemn any straps that may be faulty, in order that they may be immediately replaced.

As soon as these four simultaneous operations are concluded, directions are given by the station-master to remove the up-carriages from their position, that the rails may be clear for the arrival of the next train. At this word of command a pilot-engine, darting from its lurking place like a spider from its hole, occasionally hisses up to the rear of the train, and drags it off bodily into a siding. The usual mode, however, of getting an in-train out of the way is by the assistance of various unnoticed turn-tables, upon which portions of it are standing. By these simple contrivances the carriages, after being unhooked from

each other, are rapidly carried off into the sidings, where they are arranged, according as they may afterwards be required, among the five sets of rails which lie between the opposite platforms of the arrival and departure trains. No sooner, however, do they reach this haven, than, *fifthly*, a large gang of strong he-housemaids, clattering towards them in wooden shoes and in leather leggings rising above their bony knees, are seen advancing; some with mops in their hands, others with large chamois leathers, while others are carrying on their shoulders a yoke, from which are suspended *in equilibrio* two pails. From pipes on each side of these five sets of rails water is immediately drawn off, and the busy operation of washing then begins. Half a dozen dusty, dirty-faced, or rather dirty-bodied, carriages are simultaneously assailed on each of their sides by wet mops flying up, down, and around in all directions. The wielders of these, be it noticed, are so skilful in their vocation, that, while they are talking to their "pailers," they with great velocity continue to mop round the wood-work of the various-shaped plate-glass windows just as vigorously and as accurately as if they were looking at them; indeed, it is evident that they know the position of railway-carriage doors, windows of all forms, handles, steps, &c., so accurately, that they could mop a coach clean in the dark;—and probably they often go through these motions when they are asleep, just as King Richard III. in his dream called for his horse and for linen bandages—just as the sleeping orator ejaculates portions of his last speech—and just as an equally tired out-stretched fox-hound during the night occasionally convulsively kicks with his uppermost hind leg and yelps aloud when he thinks of the view he got of Renard as he first gallantly broke away from —— gorse. It may possibly not be known to some of the most fashionable of our readers that among "moppers" there exist the same gradations which so distinctly separate other classes of society. A "first-class mopper" would on no account demean himself by mopping a second-class carriage, and in like manner a "second-class mopper" only attains that distinction after he has for a sufficient length of time been commissioned to mop horse-boxes and common luggage-trains.

After the passenger-carriages are all washed and dried, they are minutely examined, *sixthly*, by one or more of the foremen of the coach department, who order off to their adjoining establishment any that may require repair. Those that remain are then visited, lastly, by "*the duster*," who enters each carriage with a cloth, a leather, a brush, and a dust-pan, with which apparatus he cleans the windows, wipes the wood-work, brushes the blue cloth seats, sides, and backs—and when this operation is concluded, the carriages are reported fit to depart, and accordingly are then marshalled into trains for that purpose.

Coach Department.

The new carriages for the southern division of the London and North-Western Railway are principally built by contract in the City by Mr. Wright, who also supplies carriages for other English railways, as well as a great number for Germany. The Company's establishment at Euston Station, which is therefore principally for the maintenance of carriages of various descriptions running between London and Birmingham, consists of a large area termed "the Field," where, under a covering almost entirely of plate-glass, are no less than fourteen sets of rails, upon which wounded or spare carriages lie until doctored or required. Immediately adjoining are various workshops, the largest of which is 260 feet in length by 132 in breadth, roofed with plate-glass, lighted by gas, and warmed by hot air. In this edifice, in which there is a strong smell of varnish, and in the corner of which we found men busily employed in grinding beautiful colours, while others were emblazoning arms on panels, are to be seen carriages highly finished as well as in different stages of repair. Among the latter there stood a severely wounded second-class carriage. Both its sides were in ruins, and its front had been so effectively smashed that not a vestige of it remained. The iron-work of the guard's step was bent completely upwards, and a tender behind was nearly filled with the confused *débris* of its splintered wood-work—and yet, strange to say, a man, his wife, and their little child, who had been in this carriage during

its accident, had providentially sustained no injury! Close to this immense warehouse we found a blacksmith's shop seventy-five feet square, lighted from the roof with plate-glass, containing in the centre a large chimney, around which there were simultaneously at work fourteen forges, blown by a steam-engine of seventeen-horse power, which works machinery in two other shops. As, however, we shall have occasion to describe the Company's coaching establishment at Crewe, we will abruptly take leave of the details before us.

CHAPTER V.

Lost Luggage Office.

At a short distance from the terminus of the up-trains there is a foundling-office, termed the Lost Luggage Office, in which are received all articles which the passengers leave behind them, and which on the arrival of every train are brought by the Company's "searcher" to this office. The superintendent on receiving them records in a book a description of each article, stating on what day, by what train, in what carriage it arrived, and by whom found. All luggage bearing an address is kept about forty-eight hours, and, if during that time no one calls for it, it is then forwarded by rail or other conveyance to its owner. In case it bears no address, if not inquired after, it is after a month opened; and if any clue to the owner can be found within, a letter is addressed to him. If no clue be found, the property is kept about two years, and has hitherto been then sold by auction in the large coach-factory to the Company's servants—a portion of the proceeds being handed over to the sick-fund for persons who have been hurt in the service, and the remainder to "the Friendly Society" among the men. It having, however, been ascertained that a few of the Railway men who had spare cash purchased the greater portion of these articles, it has, we understand, very lately been determined henceforward to sell the whole of this property by auction *exclusively to the public;* and as the Company's servants are not allowed to be purchasers, they can no longer derive any benefit whatever from lost property, which must often be of inestimable value to its owner, and which they therefore should have no interest, direct or indirect, in concealing from him.

A second ledger, entitled "*Luggage Inquiry Book*," is kept in this office, and, if the articles therein inquired after have not

been brought in by the searcher, copies of the description are forwarded to each of the offices where lost luggage is kept; for, by the Company's orders, all luggage found between Wolverton and London is without delay forwarded to the latter station, all between Wolverton and Birmingham to Birmingham, and so on.

It is possible, however, that the above orders may not have been attended to, and therefore, as a last resource, the superintendent of the Lost Luggage Office at Euston Station applies to the manager of the Railway Clearing House, who writes to 310 stations on forty-seven lines of rails to inquire after a lost article, be it ever so small, and if it be at none of these stations a letter is then addressed to the owner, informing him that his lost property *is not on the railway*.

In the office in which these ledgers and letter-books are made up are to be seen on shelves and in compartments the innumerable articles which have been left in the trains during the last two months, each being ticketed and numbered with a figure corresponding with the entry-book in which the article is defined. Without, however, describing in detail this property we will at once proceed to a large pitch-dark subterranean vaulted chamber, warmed by hot-air iron pipes, in which are deposited the flock of lost sheep, or, without metaphor, the lost luggage of the last two years.

Suspended from the roof there hangs horizontally in this chamber a gas-pipe about eight feet along, and as soon as the brilliant burners at each end were lighted the scene was really astounding. It would be infinitely easier to say what there is not, than what there is, in the forty compartments like great wine-bins in which all this lost property is arranged. One is chokefull of men's hats, another of parasols, umbrellas, and sticks of every possible description. One would think that all the ladies' reticules on earth were deposited in a third. How many little smelling-bottles—how many little embroidered pocket-handkerchiefs—how many little musty eatables and comfortable drinkables—how many little bills, important little notes, and other very small secrets each may have contained, we felt that we would not for the world have ascertained; but when we gazed at the

enormous quantity of red cloaks, red shawls, red tartan-plaids, and red scarfs piled up in one corner, it was, we own, impossible to help reflecting that surely English ladies of all ages who wear red cloaks, &c., must in some mysterious way or other be powerfully affected by the whine of compressed air, by the sudden ringing of a bell, by the sight of their friends—in short, by the various conflicting emotions that disturb the human heart on arriving at the up-terminus of the Euston Station; for else how, we gravely asked ourselves, could we possibly account for the extraordinary red heap before us?

Of course, in this Rolando-looking cave there were plenty of carpet-bags, gun-cases, portmanteaus, writing-desks, books, bibles, cigar-cases, &c.; but there were a few articles that certainly we were not prepared to meet with, and which but too clearly proved that the extraordinary terminus-excitement which had suddenly caused so many virtuous ladies to elope from their red shawls—in short, to be all of a sudden not only in "a bustle" behind, but all over—had equally affected men of all sorts and conditions.

One gentleman had left behind him a pair of leather hunting-breeches! another his boot-jack! A soldier of the 22nd regiment had left his knapsack containing his kit! Another soldier of the 10th, poor fellow, had left his scarlet regimental coat! Some cripple, probably overjoyed at the sight of his family, had left behind him his crutches!! But what astonished us above all was, that some honest Scotchman, probably in the extasy of suddenly seeing among the crowd the face of his faithful *Jeanie*, had actually left behind him the best portion of his bagpipes!!!

Some little time ago the superintendent, on breaking open, previous to a general sale, a locked leather hat-box, which had lain in this dungeon two years, found in it, under the hat, 65*l.* in Bank of England notes, with one or two private letters, which enabled him to restore the money to the owner, who, it turned out, had been so positive that he had left his hat-box at an hotel at Birmingham that he had made no inquiry for it at the railway-office.

CHAPTER VI.

Parcel Delivery Office.

Besides what is termed "the goods traffic," or the conveyance of heavy goods in luggage-trains, the London and North-Western Railway Company have for some time undertaken to forward by their passenger-trains, to the various stations on as well as beyond their lines, light parcels, for the conveyance and delivery of which, charges, of which the following are a sample, are made:—

For parcels under 12 lbs. weight:—	*s.*	*d.*
From London to any part of Birmingham and *vice versâ*	1	0
For distances under 160 miles	1	6
,, ,, 210 miles	2	0
From London to Durham, Carlisle, or Newcastle .	3	0
From London to Edinburgh or Glasgow . . .	4	0

The above charges include porterage and delivery of the parcels. In London, however, the delivery is limited to within three miles of the General Post-office, or say six miles from Euston Square.

The mode in which the business of this department is conducted at Euston Station is briefly as follows:—

The superintendent of the department sits in an elevated room, the sides of which being glazed enable him to look down on his right and left into two offices, both of which communicate on the south with the street by which parcels arrive from or depart to various parts of the metropolis, and on the north side with a branch railway leading into the main line. The floor of one of these two offices is generally covered with baskets, brown-paper parcels of all sizes, game, triangular boxes of wedding-cake, and other articles, which have just arrived by rail from all

parts of England, Ireland, and Scotland; that of the other with a multitude of parcels to be forwarded by rail to similar destinations. In the daytime the down parcels are despatched from the office in the break-waggons of various passenger-trains, and the following locked-up vans laden with small parcels are also forwarded every night:—

2 vans for	Birmingham,	1 van for	Newcastle,
1 ,,	Manchester,	1 ,,	Derby,
1 ,,	Liverpool,	1 ,,	Nottingham.
1 ,,	Carlisle and Lancaster,		

The number of parcels thus conveyed to and from London and the North amounted, in the year 1847, to 787,969, and in the year 1848 to 774,464; of the latter number it appears that only two were lost. The manner in which all these little parcels are circulated throughout the country is as follows:—

As soon as the empty railway vans arrive by the branch-rail close to the north side of the parcels-office, a porter, who, assisted by his comrades, has for some time previously been arranging the parcels into heaps according to their respective destinations, commencing with one set of them and rapidly taking up parcel after parcel, exclaims in a loud monotonous tone, easily enough set to music, inasmuch as it is exactly the middle note of a stout porter's voice, and which never varies for a moment during the whole operation—

"Now *Leighton*.

"A paper for Hancock, of——, light.

"A basket for Wagstaff, of——, out 8*d*., light.

"A box for Tomkins, of——, weighs (he puts it into an index-scale at his right hand, and in about three seconds adds) 26 pounds.

"A paper for Jones, of——, out 4*d*.

"Now *Leamington*.

"A paper for S. on Avon (the porter never says *Stratford*) for ——, light," &c. &c.

As fast as this chanting porter drawls out his facts the chief clerk indelibly records them, convulsively snatching up at each change of station the particular book of entry which belongs to

it. Another clerk at each exclamation hands over to a porter a bill for the cost of conveyance, which he pastes to every parcel. For all articles declared by the first porter to be "*light*," by which he means that they do not exceed twelve pounds weight—(by far the greater number are of this description)—the charge on the paper to be affixed is ready printed, which effectually prevents fraud; but where the weight *exceeds* twelve pounds, or where any sum has been paid out, the charges are unavoidably inserted in ink. The velocity with which all these little parcels are booked, weigh-billed, placed into hand-trucks, wheeled off to their respective vans, packed, locked up, and then despatched down the little branch-rail to the main line, on which is the train ready to convey them, is very surprising. While witnessing the operation, however, we could not help observing that the Company's porters took about as much notice of the words "Keep this side uppermost," "With care," "Glass," "To be kept very dry," &c., as the Admiralty would to an intimation from some dowager-duchess that her nephew, who is about to join the Thunderer as a midshipman, "has rather *a peculiar constitution*, and will therefore require for some years *very particular* CARE."

During Christmas week the number of railway parcels that flow into and ebb out of London is so enormous, that extra accommodation, as well as preparations, are necessary for their reception and despatch; and as we chanced to arrive from the country at Euston Station on Saturday the 23rd of December last, we will endeavour briefly to describe the scenes which for a very few minutes we stopped to witness.

A considerable portion of the space usually allowed for the disembarkation of the passengers arriving by the up-trains had been cut off by a lofty partition, or, as it is now-a-days termed, barricade, behind which, instead of red republicans armed with loaded muskets, we were exceedingly happy to find nothing but phalanxes, solid squares, columns, and pyramids of small parcels, the destinations of which in large letters were chalked on consecutive compartments of the north wall of the Euston territory, as follows:—

there are neither gold, silver, jewels, pictures, nor books—they contain neither covering for the body nor consolation for the mind—they belong neither to the vegetable nor to the mineral kingdom—in short, they are simply composed of good, plain, honest eatables, bequeathed by British hearts, addressed by British hands to British stomachs of all classes of society.

But as our arterial blood is of one colour, while that which returns through our veins is of another, so is there a most remarkable difference in the character of these flowing and ebbing parcels: all those which have come *into* London being either deceased turkeys or game, while the outgoing or outward-bound parcels are, with scarcely an exception, composed of barrels of live oysters, several of which are accompanied by a good heavy basket of fish. The number of barrels thus despatched from Euston Station within twenty-four hours amounted to 5009, and, as a hundred oysters are usually packed in each barrel, it is strange to think of half a million of "natives" leaving London in one day for the express purpose of wishing "a merry Christmas and a happy new year" to those whose hares, pheasants, partridges, rabbits, turkeys, and chickens have inanimately come to the metropolis on the very same day on the very same errand! To the above "bills of fare" we may add, that during last Christmas week no less than 450 waggons of live cattle arrived at Camden Station within the space of twenty-four hours.

CHAPTER VII.

The Locomotive Engine.—Camden.

Considering how many fine feelings and good feelings adorn the interior of the human heart, it is curious to observe with what facility we can put them all to sleep, or, if they won't sleep, stupify ourselves, at any moment when it becomes inconvenient to us to listen to their friendly admonitions. All the while mailing, coaching, and posting were in fashion, every man's countenance beamed—every person's tongue gabbled freely as it described not only "*the splendid rate*" (say ten miles an hour) at which he had travelled, but the celerity with which no sooner had the words "*First turn-out!*" been exclaimed by the scout, who vanished as soon as he had uttered them, than four horses in shining harness had appeared half hobbling half trotting from under the archway of the Red Lion, the Crown, or the Three Bells, before which the traveller had from a canter been almost suddenly pulled up, to receive various bows, scrapes, and curtsies from the landlord and his rosy-faced cap-beribboned wife. But, although we could all accurately describe our own enjoyments, and, like Johnson, expatiate on "the delightful sensations" we experienced in what we called *fast travelling*, who among us ever cared to ascertain, or even for a single moment to think of, the various arrangements necessary for watering, feeding, cleaning, and shoulder-healing all the poor horses whose "brilliant" performances we had so much admired? Whether they slept on straw or on stones—indeed, whether they slept at all—what was their diet—what, if any, were their enjoyments—what were their sufferings—and, lastly, how and where they eventually died—it would have been deemed exceedingly vulgar to inquire; and so, after with palpitating flanks and panting nostrils they had once been unhooked from our splinter-bars,

"Where they went, and how they fared,
No man knew, and no man cared!"

In a similar way we now chloroform all kindly feelings of inquiry respecting the treatment of the poor engine-drivers, firemen, and even of the engine that has safely conveyed us through tunnels and through storms at the rate of thirty, forty, and occasionally even fifty miles an hour—

"Oh no! we never mention them!"

and in fact scarcely do we deign to look at them. Indeed even while in the train, and most especially after we had left it, we should feel bored to death by being asked to reflect for a moment on any point or any person connected with it. We have therefore, we feel, to apologise at least to some of our readers for intruding upon them, in bringing "betwixt the wind and their nobility" the following uninteresting details.

As soon as an engine has safely dragged a passenger-train to the top of the incline at Camden Station, at which point the coupling-chains which connect it with its load are instantly unhooked, it is enabled by the switchman to get from the main line upon a pair of almost parallel side rails, along which, while the tickets are being collected, it may be seen and heard retrograding and hissing past its train. After a difficult and intricate passage from one set of rails to another, advancing or "shunting" backwards as occasion may require, it proceeds to the fire-pit, over which it stops. The fireman here opens the door of his furnace, which by a very curious process is made to void the red-hot contents of its stomach into the pit purposely constructed to receive them, where the fire is instantly extinguished by cold water ready laid on by the side. Before, however, dropping their fire, the drivers are directed occasionally to blow off their steam to clean; and we may further add that once a-week the boiler of every engine is washed out to get rid of sediment or scale, the operation being registered in a book kept in the office. After dropping his fire, the driver, carefully taking his fire-bars with him, conducts his engine into an immense shed or engine-stable 400 feet in length by 90 in breadth, generally half full of loco-

motives, where he examines it all over, reporting in a book what repairs are wanting, or, if none (which is not often the case), he reports it "*correct.*" He then takes his lamps to the lamp-house to be cleaned and trimmed by workmen solely employed to do so, after which he fetches them away himself. Being now off duty, he and his satellite fireman go either to their homes or to a sort of club-room containing a fire to keep them warm, a series of cupboards to hold their clothes, and wooden benches on which they may sit, sleep, or ruminate until their services are again required; and here it is pleasing to see these fine fellows in various attitudes enjoying rest and stillness after the incessant noise, excitement, and occasional tempests of wind and rain, to which—we will say nothing of greater dangers—they have been exposed.

The duties which the engine-driver has to perform are not only of vital importance, but of a nature which peculiarly illustrates the calm, unpretending, bull-dog courage, indigenous to the moist healthy climate of the British Isles. Even in bright sunshine, to stand—like the figure-head of a ship—foremost on a train of enormous weight, which, with fearful momentum, is rushing forward faster than any race-horse can gallop, requires a cool head and a calm heart; but to proceed at this pace in dark or foggy weather into tunnels, along embankments, and through deep cuttings, where it is impossible to foresee any obstruction, is an amount of responsibility which scarcely any other situation in life can exceed; for not only is a driver severely, and occasionally without mercy, punished for any negligence he himself may commit, but he is invariably sentenced personally to suffer on the spot for any accident that from the negligence of others may suddenly befall the road along which he travels, but over which he has not the smallest control. The greatest hardship he has to endure, however, is from cold, especially that produced in winter by evaporation from his drenched clothes passing rapidly through the air. Indeed, when a gale of wind and rain from the north-west, triumphantly sweeping over the surface of the earth at its ordinary rate of say sixty miles an hour, suddenly meets the driver of the London and North-Western, who has not only to withstand such an antagonist, but to dash through him, and in

spite of him to proceed in an opposite direction at the rate of say forty miles an hour—the conflict between the wet Englishman and Æolus, tilting by each other at the combined speed of a hundred miles an hour, forms a tournament of extraordinary interest.

As the engine is proceeding, the driver, who has not very many inches of standing-room, remains upon its narrow platform, while his fireman, on about the same space, stands close beside him on the tender. We tried the position. Everything, however, proved to be so hard, excepting the engine, which was both hard and hot, that we found it necessary to travel with one foot on the tender and the other on the engine, and, as the motion of each was very different, we felt as if each leg were galloping at a different stride. Nevertheless the Company's drivers and firemen usually travel from 100 to 120 miles per day, performing six of these trips per week; nay, a few run 166 miles per day—for which they are paid eight days' wages for six trips.

But to return to the engine which we just left in the engine-house. As soon as the driver has carefully examined it, and has recorded in a book the report we have described, the "foreman of the fitters" comes to it, and examines it all over again; and if anything is found out of order which, on reference to the book, the driver has not reported, the latter is reported by the former for his negligence. A third examination is made by Mr. Walker, the chief superintending engineer of the station, a highly intelligent and valuable servant of the Company, who has charge of the repairs of the locomotive department between Camden and Tring. If HE detects any defect that has escaped the notice not only of the driver, but of the foreman of the fitters, woe betide them both!

While the engine, with several workmen screwing and hammering at it, is undergoing the necessary repairs, we will consider for a moment a subject to which Englishmen always attach considerable importance, namely, its victuals and drink, or, in other words, its coke and water. There is at Camden Station a coke-factory composed of eighteen ovens, nine on each side, in which coal after being burnt for about fifty hours gives nearly two-thirds of its quantity of coke. These ovens produce about 20 tons of coke per day; but, as 50 tons per day are required for the

get up its steam *ab initio*, a coke-furnace has been constructed at Camden Station to hasten the operation. Here nine men during the day, and the same number throughout the night, are continually employed to heat coke, which by means of iron shovels is to be delivered red-hot into the engines' furnaces.

These preparations having been made, the driver's duties are as follows :—

On leaving the shed in the morning the engine, after having been heated at the coke-furnace, is conducted on to a great turn-table 40 feet in diameter, which twists it towards a set of rails leading to the water-crane, where it imbibes at one draught about a thousand gallons of cold water, which, under ordinary circumstances, will enable it to draw its train about 40 miles; although in slippery weather, when the wheels revolve *on*, instead of *along*, the rails, it of course would not carry it so far. It then proceeds to the coke-shed, an enclosure 210 feet by 45 feet, capable of holding 1500 tons, for its proper supply of coke, namely, 1 ton—a goods-engine usually devouring 2½ tons.

The driver, leaving his engine in charge of his fireman, now proceeds to the office, where he signs his name in a book, the object being that it may be observed whether or not he is perfectly sober. From the chief clerk he receives his coke and time ticket, upon which, at every station, he has to record whatever time he may have lost up to that point; and when his chronometer is wound up, and set to the proper time, he is then considered to be ready for his journey.

The gigantic power of the locomotive engines hourly committed to the charge of these drivers was lately strangely exemplified in the large engine-stable at the Camden Station. A passenger-engine, whose furnace-fire had but shortly been lighted, was standing in this huge building surrounded by a number of artificers, who, in presence of the chief superintendent, were working in various directions around it. While they were all busily occupied, the fire in the furnace, by burning up faster than was expected, suddenly imparted to the engine the breath of life; and no sooner had the minimum of steam necessary to move it been thus created, than this infant Hercules not only

walked *off*, but without the smallest embarrassment walked *through* the 14-inch brick wall of the great building which contained it, to the terror of the superintendent and workmen, who expected every instant that the roof above their heads would fall in and extinguish them! In consequence of the spindle of the regulator having got out of its socket, the very same accident occurred shortly afterwards with another engine, which, in like manner, walked through another portion of this 14-inch wall of the stable that contained it, just as a thorough-bred horse would have walked out of the door. And if such be the irresistible power of the locomotive engine when feebly walking in its new-born state, unattended or unassisted even by its tender, is it not appalling to reflect what must be its momentum when, in the full vigour of its life, it is flying down a steep gradient at the rate of 50 miles an hour, backed up by say 30 passenger-carriages, each weighing on an average 5½ tons? If ordinary houses could suddenly be placed on its path, it would, passengers and all, run through them as a musket-ball goes through a keg of butter; but what would be the result if, at this full speed, the engine by any accident were to be diverted against a mass of solid rock, such as sometimes is to be seen at the entrance of a tunnel, it is almost impossible to calculate, or even to conjecture. It is stated by the Company's superintendent, who witnessed the occurrence, that some time ago, an ordinary accident happening to a luggage-train near Loughborough, the waggons overrode each other until the uppermost one was found piled 40 feet above the rails!

At Camden Station there are every day five spare or pilot engines, with their steam up, ready for assisting a train up the incline, or for any special purposes that may be required.

The average cost of the locomotive engines and tenders, which, for the rails between London and Birmingham, are usually purchased by the Company from makers at Manchester, Warrington, and Liverpool, is—

Cylinder 15-inch diameter	£1,950	0	0
,, 16 ,, ...	2,113	10	0
,, 18 ,, ...	2,500	0	0

The tenders cost 500*l.* each.

CHAPTER VIII.

GOODS DEPARTMENT.

THE duties of this department, which forms one of the most important establishments at Camden Station, may very briefly be elucidated. It appears from returns lying before us, that during the six months ending the 26th of August last there entered and departed from Camden Station alone 73,732 railway waggon-loads of goods! Now in the annals of political economy there can perhaps scarcely exist a more striking exemplification of the extraordinary extent to which the latent resources of a great country may be developed by diminishing the friction, or, without metaphor, by lowering the tolls of its goods-traffic, than the fact that, notwithstanding the enormous amount thus conveyed along the London and North Western rails, the quantity carried along the Grand Junction Canal, which meanders alongside its powerful antagonist, instead of having been drained, as might have been expected, to zero, has, from the opening of the railway in 1836 up to the present period, actually increased as follows:—

	Tons.
Average amount of goods annually moved on the Grand Junction Canal during the three years prior to the opening of the London and Birmingham Railway in 1836	756,894
Average amount of ditto annually moved during the twelve years subsequent to 1836	1,039,333
Amount moved in 1847	1,163,466

Besides the innumerable arrangements necessary for the conveyance along their rails of the number of waggon-loads of goods we have stated, the Company undertake the vexatious and intricate business of collecting and delivering these goods from and to all

goods from Manchester are usually delivered in London almost with the regularity of letters. An immense quantity of fish from Billingsgate, and occasionally as much as 20 tons of fruit from Covent Garden market, are injected into the country by the midday train: indeed the London wholesale dealers in these articles do not now fear receiving too great a supply, as, whatever may be their surplus, the railway is ready to carry it off to the manufacturing districts—Manchester alone swallowing almost any quantity; besides which, large quantities of fruit are conveyed by rail as far as Glasgow. Many tons of meat in hampers, and oftentimes a flock of a hundred dead sheep, wrapped up only in cloths, are also despatched from the country to the London market.

Without tiring our readers with minute details, the following is a rough outline of the mode in which the goods-traffic is conducted.

As soon as an up luggage-train arrives at Camden Station, its loaded waggons of merchandise, which are placed under the care of the Goods-department Superintendent as soon as they arrive, are, under his directions, drawn by horses along a variety of branch-rails to a certain point, where they are left by the superintendent in the open air, from which moment Messrs. Pickford and Messrs. Chaplin and Horne—to whom the different waggons are respectively addressed, and between whom a wholesome competition exists, highly advantageous to the public—are held responsible by the Company for fire or accident of any sort; in short, for their safe delivery. The waggons thus deposited by the superintendent, solely under the canopy of heaven, are instantly approached by drivers and horses belonging to the two competing agents, who with great cleverness, by repeatedly twisting them on turn-tables, and then by drawing them along an apparent labyrinth of rails, conduct each species of goods to its own store, where, by experienced porters, it is immediately unloaded and despatched by spring waggons to its destination.

As regards the down-trade, the business transacted in this department, although apparently complicated, is very admirably

arranged. The spring waggons and carts of the Company's agents, like bees in search of honey, with extraordinary intelligence migrate in all directions to the various localities of the metropolis in search, piecemeal, of that enormous traffic, large and small, which by every diurnal pulsation of the heart of London is projected into our manufacturing districts, which in return send back to the metropolis very nearly the same amount. Every waggon-load of merchandise thus obtained, as well as every boat-load of goods (for the Company have also at Camden Station a branch water-communication leading into the Regent's Canal), is either carted at once to the particular storehouse to which it belongs, to be thence reloaded into railway vans, or it is brought to "*The General Receiving Shed*" either of Messrs. Pickford, or of Messrs. Chaplin and Horne; and to prevent mistakes, all invoice-forms and truck-labels for the former firm are printed in black, those for the latter in red. In these enormous receptacles goods "*coming in*" are arranged on one side, those "*going out*" on the other. In Messrs. Pickford's receiving shed, which is 300 feet in length by 217 in breadth, there are in operation, for the purpose of rapidly loading and unloading goods—

24 steam-cranes,
21 wooden cranes,
1 steam-doller or lift,
1 travelling-crane on the roof,
1 steam-capstan for hauling trucks along rails to the various loading bays.

We observed also at work 4 steam hay-cutters, which cut 200 trusses in four hours, and 1 steam hay-cleaner. The above machines are worked simultaneously by an engine of 16-horse power, which also raises from an Artesian well, 380 feet deep, water, which is given warm to 222 horses in adjoining stables. These horses are all named, and branded with a number on their hoofs.

In the general receiving-shed of Messrs. Chaplin and Horne there are also a series of cranes, with large stables full of horses

that work about twelve hours a-day; the "Weights of Goods allowed to be taken by them in each Vehicle" being as follows:—

From Camden.

	Tons. Cwts.		Tons. Cwts.	
4 Horses	. 5 0 . .	Not to exceed	. 6 0	waggons.
3 Do.	. 4 0 . .	Do.	. 4 10	vans.
2 Do.	. 3 0 . .	Do.	. 3 5	do.
1 Do.	. 1 10 . .	Do.	. 1 15	carts.

By the very great powers committed by the Company to their two agents, 50 waggon-loads of merchandise, collected and brought by spring-waggons to Camden Station, have often, within two hours, been despatched by the superintendent to the manufacturing districts. During the day, as fast as the spring-waggons arrive their contents are unloaded, and either left on the covered platform of the building or ranged around the walls in large compartments, labelled "Glasgow," "Birmingham," "Manchester," "Leicester," "Nottingham," "Coventry," &c.; and as on the great square of Valetta at Malta one sees congregated the costumes of almost every merchant upon earth, so do these receiving-sheds display goods and chattels of almost every description. Here lies a waggon-load of beer from Chester,—there another of sugar-loaves, in blue paper, for Northampton,—of groceries for Buckingham,—cheeses, millinery, and gas-pipes for Peterborough,—a vanload of empty hosiery skips (baskets) to return to Leicester,—empties for Glasgow,—filberts for Birmingham, &c.: and as the goods are coming in as fast as they are going out, the colours of this kaleidoscopic scene are constantly changing. Indeed, during the short time we were ruminating on the strange chance-medley of objects before us, fourteen truck-loads of goods were unladen, and eight spring-waggons loaded and despatched.

The amount of business transacted in each of these great receiving-sheds every evening, from seven till about ten o'clock, is quite astonishing. On Messrs. Pickford's great elevated platform, which at that time is laden with goods of all descriptions, several clerks, each protected by a sort of rough arbour of iron rods,

and lighted by gas, are seen, in various localities, sitting before little desks, towards which porters from all directions are wheeling, on trucks, different articles which have just been unloaded from a series of spring-vans, the bottoms of which are nearly on a level with the platform. The drivers of these carriages, entering the building at a large gate, twist, turn, and then back their horses with a dexterity which an unpractised person would think it impossible for men and horses to attain: "*Now then!*" and "*All right!*" being almost the only vociferations to be heard. As fast as the goods can be unladen from the spring-waggons to the platform, a porter lustily calls out the address on each bale or parcel, which is actively registered by a clerk. These invoices are then briskly sent across to the other side of the platform, in order that each article enumerated therein, when reloaded—as it almost immediately is, into railway waggons—may be ticketed off, to ascertain whether every package taken in at the receiving side of the platform has *bonâ fide* been safely despatched from the other.

Until the visitor to this extraordinary nocturnal scene has had some time first to recover his composure, and then to observe, analyse, and reflect on the various arrangements simultaneously in operation before him, the picture altogether is really astounding. For from one side of the platform a set of active porters are centripedally wheeling from different spring-waggons innumerable packages to the recording clerks, as eagerly as from these clerks (whose duty it is to record the weight of every article, and to affix to it the Company's printed charge for conveyance to its address) other porters, equally active, are centrifugally wheeling other packages to various railway vans, which, as fast as they can be filled, are drawn away from the despatching side of the platform, and immediately replaced by empty ones. One set of porters are wheeling to a recording clerk a waggon-load of raw silk, valued at 9000*l.*, from China, which, *viâ* the South-Western Railway, has just arrived from Southampton to go to Macclesfield to be manufactured; another set, Russia tallow, in casks; others, draperies; another set, yarns for Gloucester; one porter has on his truck a very small but heavy load of iron or lead;

another, with comparative ease, is wheeling through the crowd a huge wool-bag, large enough to contain, if properly packed, a special jury. Here comes a truck of mustard, in small casks, followed by another full of coffee; there goes a barrow-load of drugs—preceding a cask of spirits, which, to prevent fraud, has just been weighed, tapped, gauged, and sampled; also several trucks full of household furniture; the family warming-pan being tacked round the body of the eight-day clock, &c. This extraordinary whirl of business, set to music by the various noises proceeding from the working of the steam-cranes, steam-doller, steam-capstan, common cranes, and other machinery above the platform—from the arrival, turning, backing, and departure of spring-waggons beneath it—from the rumbling of porters' trucks crossing the platform, as also of the railway vans as, laden with goods, they are successively rolled away—forms altogether, we repeat, a scene which, though rarely visited, is astounding to witness, and which, we are sensible, we have but very faintly described.

But, besides the amount of business above mentioned daily transacted in each of the agents' great "receiving-sheds," there are nine other sheds, in which, throughout the day, and especially at night, the same process on a smaller scale is going on. Close to these stores there is also a water-dock for iron and heavy goods to be shipped for the Thames. The carting establishments of Messrs. Pickford and Chaplin for the collection and delivery of their share only of the goods-traffic—for the Company have establishments of their own for loading and unloading at every station except London—would appear to any foreigner unacquainted with the modest and unassuming powers with which the mercantile business of England is quietly transacted, to be incomprehensible and almost incredible. For instance—

Messrs. Pickford's establishment, on account of the London and North-Western Railway, is as follows:—

Clerks.	Porters.	Horses.	Vans.	Waggons.	Drays.
234	538	396	82	57	25

The weights carted by Messrs. Pickford, on account of the Company, for the year ending the 30th of June last, amounted to—

	Tons.	cwts.	qrs.	lbs.
Collected	133,437	18	0	15
Delivered	139,898	19	0	5
Making a gross total of	273,336	17	0	20

Or rather more than 841 tons per day.

And yet the Company's merchandise operations at Liverpool exceed those at London in the proportion of 9 to 6½ !

As soon as the two agents, at their respective receiving-sheds, have loaded their trucks, and have securely covered them with water-proof and fire-proof tarpaulins, they turn them out, labelled, into the open air, from which moment they are considered to be in the hands of the Company's superintendent of the goods-department. Accordingly, under his direction, they are immediately drawn by horses first over a weighbridge to receive their weigh-bills, and thence to a series of ten turn-tables, by which they are scattered among thirteen sets of rails, where they are marshalled into trains for their respective destinations. In this operation it is alarming to see the superintendent's horses dragging the various luggage-vans, for not only are the rails as well as the pavement between them exceedingly slippery, but as the carriages have no shafts, the poor horse has not power to stop his load, and accordingly affixed to it by his traces he trots away before it, until it appears as if he must inevitably be smashed to a sandwich between it and the carriage at rest which he is approaching; however, just before the collision between the buffers of each vehicle takes place, the dull-looking animal jumps aside, and very dexterously saves himself from annihilation. The luggage-trains thus formed are usually composed of 35, but sometimes of 70 or 90 waggons, weighing when empty about three tons each, and averaging when laden about six tons. At the rear of each of these trains there sits a guard. The Company's goods-waggons of all descriptions amount in number to 6236.

Engine Stable and Cattle Wharf.

In order to prevent the locomotive engines which draw these luggage-trains from crossing, or otherwise perilling the main passenger-line at Camden Station, there has been constructed an immense rotunda, 160 feet in diameter, lighted from the top by plates of glass nine feet in length by half an inch thick, and capable of containing twenty-four of the largest-class engines. In the centre of this great brick building there is a turn-table 40 feet in diameter, from whence the engines radiate to their twenty-four stalls, which on a large scale much resemble those constructed in a stable for hunters. The majority of these locomotives are capable of drawing 600 tons at the rate of twelve miles an hour. Each, when supplied with coke and water, with steam up ready for its journey, weighs about 50 tons. At the entrance of this building there is a pit into which, after their journey, they may drop their fire, and between the rails in each of the twenty-four stalls we observed a smaller pit to enable artificers to work beneath any engine that may require reparation. The drivers of these huge locomotives, after every journey, inspect and report in a book, as in the passenger-trains, any repairs that may be required, and the engines are thoroughly cleaned every time they come in.

At a short distance from this rotunda we observed a platform about 300 yards long, constructed for the landing of cattle, which arrive there generally on Thursdays and Saturdays from 2 P.M. till midnight. Fifty waggon-loads of bullocks, sheep, or pigs can here be unloaded at a time, and then driven into strong pens or pounds, constructed in the rear. The Company's cattle and merchandise waggons are usually painted blue, their sheep-waggons green. On the arrival of a train of cattle it is interesting to see such a quantity of polished horns, bright eyes, streams of white breath, and healthy black wet noses projecting above the upper rail of their respective waggons, and fatal as is the object of their visit to John Bull's metropolis, it is some consolation to reflect that—poor things—they are, at all events, in ignorance

of the fate that awaits them. In disembarking the cattle, in spite of every precaution, an enfuriated Welsh or a wild Irish bullock will occasionally escape from this platform, and by roaring, jumping, and galloping, with depressed head and up-stretched tail—

> "Hereditary bondsmen! know ye not,
> Who would be free, himself must strike the blow!"—

create no small consternation as well as confusion among the green-coated pointsmen, porters, and policemen in charge of the various sets of tributary rails which flow from the waggon department into the main line. Instead, however, of attempting, as in the case of Mr. Smith O'Brien, to capture the fugitive by force, this object is effected by the simple stratagem of instantly turning loose several other black-nosed bullocks, which he no sooner sees, than, running and galloping towards the herd, he is quietly driven with them into a pen, where he appears quite to enjoy "the Union," which a few minutes ago he had so violently and so vociferously attempted to "*repale.*"

Waggon Hospital.

Among the large establishments at Camden Station is one for the maintenance and repair of the luggage-trucks and goods-carriages of the Southern District, namely, from London to Birmingham—in which alone there are 2000 luggage-waggons with a proportionate number of trucks. The construction-shop for this department, in which 129 men were at work, is 437 feet in length by 64 in breadth. With its sideways it is capable of containing and of repairing at one time 100 carriages; the average number in hospital being, however, from 60 to 70. In the smiths' shop we observed working at once 14 common forges blown by steam, also four portable ones. In locked-up vaulted stores adjoining there was lying, besides deals and Memel planks, 4000*l.* worth of oak timber in scantlings of the various sizes required, each lot ticketed with its dimensions. It is surprising to observe the quantity of iron and oak timber used in the construc-

tion of the Company's luggage-trucks. Nevertheless, although they are built infinitely stronger in proportion than any ship (for their oak stancheons, being straight instead of curved, when they come in collision strike end foremost), yet we witnessed results of accidents which were really appalling; in many cases the largest of these timbers had been splintered; indeed, in a railway smash the British oak usually either stands the shock without flinching, or, if it *does* give, shivers into atoms. Barring, however, accidents, a luggage-truck or waggon will last about twelve years.

Among the Company's goods-carriages we observed eight powder-magazines, constructed under a patent invention of the superintendent, Mr. Henson. They were covered outside with sheet iron, lined with wood, had leaden floors, and the axles were cased with hornbeam to prevent vibration. With these precautions they each safely convey 4½ tons of gunpowder through and over the sparks of fire and red-hot coals that are continually, during the progress of a train, flying from the funnel-pipe or dropping from the furnace of the engine.

As soon as a luggage-train has been unloaded at Camden Station all the wheels of the waggons are gauged to see that there are no bent axles, and that none of the "journals," or working ends of the axles, have been heated, for they sometimes get red-hot; and we may here remark, that under heavy loads the tremendous vibration of the axles of goods-carriages during their journeys materially alters the composition of the iron, and that when the axles have once been red-hot, although after cooling they are as strong as ever, they are always particularly liable to get red-hot again, and the brass boxes amalgamating with the iron, the ends of the largest axles are occasionally wrenched off as one would break a carrot. The luggage-waggons are minutely inspected on arriving and on departing from Camden, Wolverton, and Rugby; besides which the guard hastily examines them at every station, where they are also greased if required.

The Pointsman.

Among the servants of a railway company, or rather we should say of the public, there is no one who, in his secluded station, has more important duties to attend to than "the pointsman," in charge of the switches for diverting a train from one set of rails to another. As it is of course necessary that these switches should be carefully worked and guarded by night as well as by day, there are usually appointed to each station two pointsmen, each of whom remains on duty twelve hours at a time, taking the night and day work week about. At Camden Station one of these men has fourteen switches to attend to, and at Wolverton thirteen pairs. At the latter place, to prevent intrusion and to increase precaution, the pointsman has always the signal of danger on, but on perceiving an up-train about a mile off, he shows a green flag to the Station signal-man, and does not avert that of danger until he has received answer that "all is right." In thick weather he himself works a subterranean auxiliary signal 500 yards off, showing lamps of different colours. In a fog, to prevent any train running into the station, a man is sent down the line about a mile, to affix upon the rails, every 200 yards, one of Toy and Hansom's patent fog-signals, which, exploding under the engine with the report of a small cannon, warn the driver to stop and remain where he is, until some one comes to give him orders. At Crewe Station, from whence radiate three important lines of rails, namely, on the right to Manchester, straight on to Liverpool, and on the left to Chester, there are constantly on duty three pointsmen, one of whom has seventeen pairs of points to attend to, namely, five belonging to the Chester line, one to the Liverpool, eleven to the workshops. His box stands between the Liverpool and Chester lines.

Nothing can apparently be more cheerless than the existence of these poor fellows, who, cut off from society, in all weathers and in all seasons have, in solitude, to perform duties for which no passing traveller ever thanks them, and which he probably does not even know that they perform. It is, however, providen-

tially decreed that the human heart warms under almost every description of responsibility; and, accordingly, we invariably found these pointsmen not only contented, but apparently intently interested in their important duties; indeed the flowers which we observed blooming around their little wooden habitations were not, we felt, unappropriate emblems of the happiness which naturally springs up in the heart of every man who will honestly perform the duties of his station. The Company's pointsmen have nominally not very high wages:—a gratuity, however, every twelve months is given to them, provided they cause no accident; but should one occur from their switches, no matter how small, they forfeit it—an arrangement, we think, very cleverly conceived.

CHAPTER IX.

WOLVERTON.

FLYING by rail through green fields below Harrow Hill and thence to Watford,—stopping for a moment in a deep cutting to hear a man cry "*Tring!*" and a bell say "*Ring!*" until the passenger gets so confused with the paltry squabble that he scarcely knows which of the two competitors is vociferating the substantive and which the verb,—we will now conduct our readers to the Station and little town of Wolverton.

As every city, village, or hamlet on the surface of the globe is usually inhabited by people of peculiar opinions, professions, character, tastes, fashions, follies, whims, and oddities, there is always to be witnessed a corresponding variety in the allinement and architecture of their dwellings—the forms and excrescences of each often giving to the passing traveller a sort of phrenological insight into the character of the inmates. One street, inhabited by poor people, is as crooked as if it had been traced out by the drunken Irishman who, on being kindly questioned, in a very narrow lane across which he was reeling, as to the length of road he had travelled, replied, "*Faith! it's not so much the length of it as the* BREADTH *of it that has tired me!*" Another—a rich street —is quite straight. Here is a palace—there are hovels. The hotel is of one shape—the stock-exchange of another. There are private houses of every form—shops of every colour—columns, steeples, fountains, obelisks *ad infinitum*. Conspicuous over one door there is to be seen a golden pestle and mortar—from another boldly projects a barber's pole—a hatchment decorates a third—the Royal Arms a fourth—in short, it would be endless to enumerate the circumstantial evidence which in every direction proves the truth of the old saying, "*Many men, many minds.*"

To all general rules, however, there are exceptions; and certainly it would be impossible for our most popular auctioneer, if he wished ever so much to puff off the appearance of Wolverton, to say more of it than that it is a little red-brick town composed of 242 little red-brick houses—all running either this way or that way at right angles—three or four tall red-brick engine-chimneys, a number of very large red-brick workshops, six red houses for officers—one red beer-shop, two red public-houses, and, we are glad to add, a substantial red school-room and a neat stone church, the whole lately built by order of a Railway Board, at a railway station, by a railway contractor, for railway men, railway women, and railway children; in short, the round cast-iron plate over the door of every house, bearing the letters L. N. W. R., is the generic symbol of the town. The population is 1405, of whom 638 are below sixteen years of age; indeed, at Wolverton are to be observed an extraordinary number of young couples, young children, young widows, also a considerable number of men who have lost a finger, hand, arm, or leg. All, however, whether [illegible]ole or mutilated, look for support to "the Company," and not only their services and their thoughts but their parts of speech are more or less devoted to it:—for instance, the pronoun "*she*" almost invariably alludes to some locomotive engine; "*he*" to "the chairman;" "*it*" to the London Board. At Wolverton the progress of time itself is marked by the hissing of the various arrival and departure trains. The driver's wife, with a sleeping infant at her side, lies watchful in her bed until she has blessed the passing whistle of "the down mail." With equal anxiety her daughter long before daylight listens for the rumbling of "the 3½ A.M. goods up," on the tender of which lives the ruddy but smutty-faced young fireman to whom she is engaged. The blacksmith as he plies at his anvil, the turner as he works at his lathe, as well as their children at school, listen with pleasure to certain well-known sounds on the rails which tell them of approaching rest.

The workshops at Wolverton, taken altogether, form, generally speaking, an immense hospital or "Hôtel des Invalides" for the sick and wounded locomotive engines of the Southern

District. We witnessed sixty of them undergoing various operations, more or less severe, at the same time. Among them was Crampton's new six-wheel engine, the hind wheels of which are eight feet high, weighing thirty-eight tons, and with its tender sixty tons. It is capable of drawing at the usual speed twelve carriages laden with passengers. The workshops at this station are so extensive, that it would be tedious and indeed almost impracticable to describe them in detail; we will therefore merely mention that in one of them we saw working at once by the power of an 18-horse steam-engine twelve turning-lathes, five planing-machines, three slotting-machines, two screw-bolt ditto—and, as a trifling example of the undeviating accuracy with which these contrivances work, we may state that from a turning-lathe a shaving from cold iron will sometimes continue to flow for forty feet without breaking. There are a large cast-iron foundry, a brass foundry, machines for grinding, and also for polishing; sheers for cutting, and stamps for punching cold iron as if it were pasteboard; an immense oven for heating tires of wheels; a smith's shop containing twenty-four forges, all of which were in operation at once. Two steam-engines—one for machinery, the other for pumping water for the town and offices only, for the Company's well-water here, as at Camden Station, disagrees with the locomotives. A large finishing store, in which were working by steam fifteen turning-lathes, five slotting-machines, five planing ditto, one screwing ditto, two drilling ditto, two shaving ditto. Beneath the above we entered another workshop containing sixteen turning-lathes, two drilling-machines, one slotting ditto, one screwing ditto, one nut ditto, one cylinder-boring ditto, one shaping ditto. In the great store-yard there is an hydraulic press of a power of 200 tons for squeezing wheels on to their axles, or wrenching them off. Another workshop is filled with engines undergoing repair, and adjoining it there is a large store or pharmacopœia, containing, in the form of oil, tallow, nuts, bars, bolts, &c., all the medicine which sick locomotives occasionally require.

At a short distance towards the south we entered a beautiful building, lighted during the day by plate-glass in the roof, by

gas at night, and warmed by steam. In its centre there stands a narrow elevated platform, whereon travels a small locomotive, which brings into the building, and deposits on thirteen sets of rails on each side, twenty-six locomotive engines for examination and repair. On the outside, in the open air, we found at work what is called "*a scrap drum*," which by revolving cleans scraps of old rusty iron, just as a public school improves awkward boys by hardly rubbing them one against another. The scrap iron, after having been by this discipline divested of its rust, is piled on a small wooden board for further schooling, and when sufficiently hot the glowing mass is placed under a steam-hammer alongside, whose blows, each equal to about ten tons, very shortly belabour to "equality and fraternity" the broken bolts, bars, nuts, nails, screw-pins, bits of plate-iron, &c., which are thus economically welded into a solid mass or commonwealth. In another smelting-shop, 150 feet in length, we saw at work fourteen forges, six turning-lathes, one drilling-machine, and one iron-shaving machine. Lastly, there are gas-works for supplying the whole of the Company's establishment with about seventy or eighty thousand cubic feet of gas per day.

The above is but a faint outline of the Company's hospital at Wolverton for the repair and maintenance merely of their locomotive engines running between London and Birmingham.

The magnitude of the establishment will best speak for itself; but as our readers, like ourselves, are no doubt tired almost to death of the clanking of anvils—of the whizzing of machinery—of the disagreeable noises created by the cutting, shaving, turning, and planing of iron—of the suffocating fumes in the brass-foundry, in the smelting-houses, in the gas-works—and lastly of the stunning blows of the great steam-hammer—we beg leave to offer them a cup of black tea at the Company's public refreshment-room, in order that, while they are blowing, sipping, and enjoying the beverage, we may briefly explain to them the nature of this beautiful little oasis in the desert.

Wolverton Refreshment-Room.

In dealing with the British nation, it is an axiom among those who have most deeply studied our noble character, that to keep John Bull in beaming good-humour it is absolutely necessary to keep him always *quite full.* The operation is very delicately called "*refreshing him;*" and the London and North-Western Railway Company having, as in duty bound, made due arrangements for affording him, once in about every two hours, this support, their arrangements not only constitute a curious feature in the history of railway management, but the *dramatis personæ* we are about to introduce form, we think, rather a strange contrast to the bare arms, muscular frames, heated brows, and begrimed faces of the sturdy workmen we have just left.

The refreshment establishment at Wolverton is composed of—

1. A matron or generallissima.
2. Seven very young ladies to wait upon the passengers.
3. Four men and three boys do. do.
4. One man-cook, his kitchen-maid, and his two scullery-maids.
5. Two housemaids.
6. One still-room-maid, employed solely in the liquid duty of making tea and coffee.
7. Two laundry-maids.
8. One baker and one baker's-boy.
9. One garden-boy.

And lastly, what is most significantly described in the books of the establishment—

10. "An odd-man."

"Homo sum, humani nihil à me alienum puto."

There are also eighty-five pigs and piglings, of whom hereafter.

The manner in which the above list of persons, in the routine of their duty, diurnally revolve in "the scrap-drum" of their worthy matron, is as follows:—Very early in the morning—in cold winter long before sunrise—"the odd-man" wakens the two

house-maids, to one of whom is intrusted the confidential duty of awakening the seven young ladies exactly at seven o'clock, in order that their "première toilette" may be concluded in time for them to receive the passengers of the first train, which reaches Wolverton at 7h. 30m. A.M. From that time until the departure of the passengers by the York Mail train, which arrives opposite to the refreshment-room at about eleven o'clock at night, these young persons remain on duty, continually vibrating, at the ringing of a bell, across the rails—(they have a covered passage high above them, but they never use it)—from the North refreshment-room for down passengers to the South refreshment-room constructed for hungry up-ones. By about midnight, after having philosophically divested themselves of the various little bustles of the day, they all are enabled once again to lay their heads on their pillows, with the exception of one, who in her turn, assisted by one man and one boy of the establishment, remains on duty receiving the money, &c. till four in the morning for the up-mail. The young person, however, who in her weekly turn performs this extra task, instead of rising with the others at seven, is allowed to sleep on till noon, when she is expected to take her place behind the long table with the rest.

The scene in the refreshment-room at Wolverton, on the arrival of every train, has so often been witnessed by our readers, that it need hardly be described. As these youthful handmaidens stand in a row behind bright silver urns, silver coffee-pots, silver tea-pots, cups, saucers, cakes, sugar, milk, with other delicacies over which they preside, the confused crowd of passengers simultaneously liberated from the train hurry towards them with a velocity exactly proportionate to their appetites. The hungriest face first enters the door, "magnâ comitante catervâ," followed by a crowd very much resembling in eagerness and joyous independence the rush at the prorogation of Parliament of a certain body following their leader from one house to the bar of what they mysteriously call 'another place.' Considering that the row of young persons have among them all only seven right hands, with but very little fingers at the end of each, it is really astonishing how, with such slender assistance, they can in

come away!' —and as they have all paid their fares, and as the engine is loudly hissing—attracted by their pockets as well as by their engagements, they soon, like the swallows of summer, congregate together and then fly away.

It appears from the books that the annual consumption at the refreshment-rooms averages—

182,500	Banbury cakes.	5,110	lbs. of moist sugar.
56,940	Queen cakes.	16,425	quarts of milk.
29,200	patés.	1,095	,, cream.
36,500	lbs. of flour.	8,088	bottles of lemonade.
13,140	,, butter.	10,416	,, soda-water.
2,920	,, coffee.	45,012	,, stout.
43,800	,, meat.	25,692	,, ale.
5,110	,, currants.	5,208	,, ginger-beer.
1,277	,, tea.	547	,, port.
5,840	,, loaf-sugar.	2,095	,, sherry.

And we regret to add,

666	bottles of	gin.
464	,,	rum.
2,392	,,	brandy.

To the eatables are to be added, or driven, the 85 pigs, who after having been from their birth most kindly treated and most luxuriously fed, are impartially promoted, by seniority, one after another, into an infinite number of pork pies.

Having, in the refreshment sketch which we have just concluded, partially detailed, at some length, the duties of the seven young persons at Wolverton, we feel it due to them, as well as to those of our readers who, we perceive, have not yet quite finished their tea, by a very few words to complete their history. It is never considered quite fair to pry into the private conduct of any one who performs his duty to the public with zeal and assiduity. The warrior and the statesman are not always immaculate; and although at the Opera ladies certainly sing very high, and in the ballet kick very high, it is possible that their voices and feet may sometimes reach rather higher than their characters. Considering, then, the difficult duties which our seven young attendants have to perform—considering the temptations to which they are

Weekly Dispatch, Liverpool Albion, Glasgow Post, Railway Record, Airs' Birmingham Gazette, Bentley's Miscellany, Chambers' Information, Chambers' Journal, Chambers' Shilling Volume, Practical Mechanic's Journal, Mechanic's Magazine.

Besides the above there is a flying library of about 600 volumes for the clerks, porters, police, as also for their wives and families, residing at the various stations, consisting of books of all kinds, excepting on politics and on religious controversies. They are despatched to the various stations, carriage free, in nineteen boxes given by the Company, each of which can contain from twenty to fifty volumes.

For the education of the children of the Company's servants, a school-house, which we had much pleasure in visiting, has been constructed on an healthy eminence, surrounded by a small court and garden. In the centre there is a room for girls, who, from nine till five, are instructed by a governess in reading, writing, arithmetic, geography, grammar, history, and needlework. Engaged at these occupations we counted fifty-five clean, healthy faces. In the east wing we found about ninety fine, stout, athletic boys, of various ages, employed in the studies above mentioned (excepting the last), and learning, moreover, mathematics and drawing. One boy we saw solving a quadratic equation—another was engaged with Euclid—others with studying land-surveying, levelling, trigonometry, and one had reached conic sections.

At the western extremity of the building, on entering the infant-school, which is under the superintendence of an intelligent looking young person of about nineteen years of age, we were struck by the regular segments in which the little creatures were standing in groups around a tiny monitor occupying the centre of each chord. We soon, however, detected that this regularity of their attitudes was caused by the insertion in the floor of various chords of hoop iron, the outer rims of which they all touched with their toes. A finer set of little children we have seldom beheld; but what particularly attracted our attention was three rows of beautiful babies sitting as solemn as judges on three steps one above another, the lowest being a step higher

CHAPTER X.

LETTERS AND NEWSPAPERS.

AMONG the manifold arrangements which characterise the interior of the British hive there is, we believe, no one which offers to an intelligent observer a more important moral than the respect which is everywhere paid by us to the correspondence of the nation. Prior to the introduction of railways our post-office establishment was the admiration of every foreigner who visited us. But although our light mail-coaches, high-bred horses, glittering harness, skilful coachmen, resolute guards, and macadamised roads were undeniably of the very best description, yet the moral basis on which the whole fabric rested, or rather the power which gave vitality to its movements, evidently was a patriotic desire indigenous in the minds of people of all classes to protect, as their common wealth, the correspondence of the country; and accordingly it mattered not whether on our public thoroughfares were to be seen a butcher's cart, a brewer's dray, a bishop's coach, a nobleman's landau, the squire's chariot or his tenant's waggon;—it mattered not what quantity of vehicles were assembled for purposes good, bad, or indifferent, for church, for race-course, or for theatre;—it mattered not for what party of pleasure or for what political purpose a crowd or a mob might have assembled; for at a single blast through a long tin horn people of all ranks and conditions, however they might be disposed to dispute on all other subjects, were ready from all quarters to join together in exclaiming, "MAKE WAY FOR THE MAIL!"

At the magic whistle of the locomotive engine the whole of the extremely slow, dull, little-bag system we have just referred to suddenly fell to pieces. Nevertheless, the spirit that had animated it flew from the road to the rails, and although our

penny-postal arrangements, notwithstanding their rapid growth, are less conspicuous, there exists throughout the country the same honest anxiety that our letter-bags should be circulated over the surface of the United Kingdom with the utmost possible care and despatch. In order, however, to fulfil this general desire the duties which our Postmaster-General is now required to perform are most extraordinary.

The difficulty of transmitting from London to every part of the United Kingdom, and *vice versâ*, the innumerable quantity of letters which, like mushrooms springing up from a bed of spawn, have arisen from our sudden adoption of a penny-postage, would alone require minute calculations, involving an infinity of details; but when it is considered that besides this circulation from and to the heart of the metropolis—(the average weight of letters and newspapers carried daily by the London and North-Western Railway is seventeen tons)—there exists simultaneously a cross circulation, not only from and to every great city and town, but from every little post-office to every part of the United Kingdom and *vice versâ*, and moreover to every region on the globe, the eccentric zigzag courses of all these letters to their respective destinations may justly be compared to the fiery tracks and sparks created by the sudden ignition of a sackful of fireworks of all descriptions; of rockets, Catherine wheels, Roman candles, squibs, stars, crackers, flower-pots, some flying straight away, while others are revolving, twisting, radiating, bouncing, exploding in every possible direction and in all ways at once.

To explain the mode in which all our postal arrangements are conducted would not only exceed our limits, but be foreign to our subject; we will therefore only attempt to supply our readers with a slight sketch of a very small portion of this business, namely, the transmission of letters from the metropolis by the London and North-Western Railway's night mail.

While the passengers by the Lancashire mail-train are taking their seats and making other preparations for their departure, two or three Post-office vans are seen to enter the main carriage gate of the Euston Station, and then to drive close to their tenders on the railway, which form the last carriages of the train. The

servants of the Post-office, rapidly unloading their vans, remove a portion of the bags they contained into the travelling-office and the remainder into two large tenders, which, as soon as they are filled, are locked up by the guard, who then takes his place in the flying office, in which we propose to leave him to his flight for 132½ miles—only observing, however, that no sooner has he started than another flying post-office, which had been lying in ambush, advances (with its tender), and, after being loaded in a similar manner, in a quarter of an hour they are despatched to Yorkshire and the East of Scotland.

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It had been raining for upwards of twenty-four hours, and it was still pouring when, at about half-past one o'clock of a dark winter's night, we reached the railway platform at Stafford, to await there the arrival from Euston Station of the night-mail, whose loading and departure we have just described. At that lonely hour, excepting a scarlet-coated guard, who, watching over a pile of letter-bags just arrived from Birmingham by a branch-train, was also waiting for the down-mail, there were no other passengers on the platform; and, save the unceasing pattering of the rain, there appeared nothing to attract the attention but the glaring lamps of three or four servants of the Company. One with his lantern in his left hand was writing in a small memorandum-book placed on a desk before him. Two others with lights suspended round their necks were greasing the axles of some carriage whose form could not be distinguished, while the station-man on duty with his lamp in his hand was pacing up and down the boarded platform.

At this moment the signal-man had scarcely announced the approach of an up-train when there rapidly rushed by a very long, low, dark, solid mass protected by some sort of wet black-looking covering which here and there glistened as it rolled past the four lamps that were turned towards it; in short, it was a

The flying Post-office.

This office, which every evening flies away from London to Glasgow, and wherein Government clerks are busily employed in receiving, delivering, and sorting letters all the way, is a narrow carpeted room, twenty-one feet in length by about seven in breadth, lighted by four large reflecting lamps inserted in the roof, and by another in a corner for the guard. Along about two-thirds of the length of this chamber there is affixed to the side wall a narrow table, or counter, covered with green cloth, beneath which various letter bags are stowed away, and above which the space up to the roof is divided into six shelves fourteen feet in length, each containing thirty-five pigeon-holes of about the size of the little compartments in a dove-cote. At this table, and immediately fronting these pigeon-holes, there were standing as we flew along, three Post-office clerks intently occupied in convulsively snatching up from the green-cloth counter, and in dexterously inserting into the various pigeon-holes, a mass of letters which lay before them, and which, when exhausted, were instantly replaced from bags which the senior clerk cut open, and which the guard who had presented them then shook out for assortment. On the right of the chief clerk the remaining one-third of the carriage was filled nearly to the roof with letter-bags of all sorts and sizes, and which an able-bodied Post-office guard, dressed in his shirt-sleeves and laced waistcoat, was hauling at and adjusting according to their respective brass-labels. At this laborious occupation the clerks continue standing for about four hours and a half; that is to say, the first set sort letters from London to Tamworth, the second from Tamworth to Preston, the third from Preston to Carlisle, and the fourth letters from Carlisle to Glasgow. The clerks employed in this duty do not permanently reside at any of the above stations, but are usually removed from one to the other every three months.

As we sat reclining and ruminating in the corner, the scene was as interesting as it was extraordinary. In consequence of the rapid rate at which we were travelling, the bags which were

hanging from the thirty brass pegs on the sides of the office had a tremulous motion, which at every jerk of the train was changed for a moment or two into a slight rolling or pendulous movement, like towels, &c., hanging in a cabin at sea. While the guard's face, besides glistening with perspiration, was—from the labour of stooping and hauling at large letter-bags—as red as his scarlet coat which was hanging before the wall on a little peg, until at last his cheeks appeared as if they were shining at the lamp immediately above them almost as ruddily as the lamp shone upon them—the three clerks were actively moving their right hands in all directions, working vertically with the same dexterity with which compositors in a printing-office horizontally restore their type into the various small compartments to which each letter belongs. Sometimes a clerk was seen to throw into various pigeon-holes a batch of mourning letters, all directed in the same handwriting, and evidently announcing some death; then one or two registered letters wrapped in green covers. For some time another clerk was solely employed in stuffing into bags newspapers for various destinations. Occasionally the guard, leaving his bags, was seen to poke his burly head out of a large window behind him into pitch darkness, enlivened by the occasional passage of bright sparks from the funnel-pipe of the engine, to ascertain by the flashing of the lamps as he passed them, the precise moment of the train clearing certain stations, in order that he might record it in his "time-bill." Then again a strong smell of burning sealing-wax announced that he was sealing up, and stamping with the Post-office seal, bags three or four of which he then firmly strapped together for delivery. All of a sudden, the flying chamber received a hard sharp blow, which resounded exactly as if a cannon-shot had struck it. This noise, however, merely announced that a station-post we were at that moment passing, but which was already far behind us, had just been safely delivered of four leather letter-bags, which on putting our head out of the window, we saw quietly lying in the far end of a large strong iron-bound sort of landing-net or cradle, which the guard a few minutes before had by a simple movement lowered on purpose to receive them. But not only

had we received four bags, but at the same moment, and apparently by the same blow, we had, as we flew by, dropped at the same station three bags which a Post-office authority had been waiting there to receive. The blow that the pendent bag of letters, moving at the rate say of forty miles an hour, receives in being suddenly snatched away, must be rather greater than that which the flying one receives on being suddenly at that rate dropped on the road. Both operations, however, are effected by a projecting apparatus from the flying post-office coming suddenly into contact with that protruding from the post.

As fast as the clerks could fill the pigeon-holes before them, the letters were quickly taken therefrom, tied up into a bundle, and then by the guard deposited into the leather bag to which they belonged. On very closely observing the clerks as they worked, we discovered that, instead of sorting their letters into the pigeon-holes according to their superscriptions, they placed them into compartments of their own arrangement, and which were only correctly labelled in their own minds; but as every clerk is held answerable for the accuracy of his assortment, he is very properly allowed to execute it in whatever way may be most convenient to his mind or hand.

Besides lame writing and awkward spelling, it was curious to observe what a quantity of irrelevant nonsense is superscribed upon many letters, as if the writer's object was purposely to conceal from the sorting clerk the only fact he ever cares to ascertain, namely, *the post town*. Their patience and intelligence, however, are really beyond all praise; and although sometimes they stand for eight or ten seconds holding a letter close to their lamp, turning sometimes their head and then it, yet it rarely happens that they fail to decipher it. In opening one bag, a lady's pasteboard work-box appeared all in shivers. It had been packed in the thinnest description of whitey-brown paper. The clerk spent nearly two minutes in searching among the fragments for the direction, which he at last discovered in very pale ink, written apparently through a microscope with the point of a needle. The letters sorted in the flying post-office are, excepting a few "late letters," principally cross-post letters, which,

although packed into one bag, are for various localities. For instance, at Stafford the mail takes up a bag made up for Birmingham, Wolverhampton and intermediate places, the letters for which, being intermixed, are sorted by the way, and left at the several stations.

The bags have also to be stowed away in compartments according to their respective destinations. One lot for Manchester, Liverpool, and Dublin; one for Chester; a bundle of bags for Newcastle-under-Lyne, Market-Drayton, Eccleshall, Stone, Crewe, Rhuabon; a quantity of empty bags to be filled coming back; a lot for Edinburgh, Glasgow, and Carlisle; and one great open bag contained all the letter-bags for Dublin taken upon the road.

The minute arrangements necessary for the transaction of all this important business at midnight, while the train is flying through the dark, it would be quite impossible to describe. The occupation is not only highly confidential, but it requires unceasing attention, exhausting to body and mind. Some time ago, while the three clerks, with their right elbows moving in all directions, were vigorously engaged in sorting their letters, and while the guard, with the light of his lamp shining on the gilt buttons and gold lace which emblazoned the pockets of his waistcoat, was busily sealing a letter-bag, a collision took place, which, besides killing four men, at the same moment chucked the sorting clerks from their pigeon-holes to the letter-bags in the guard's compartment. In due time the chief clerk recovered from the shock; but what had happened—why he was lying on the letter-bags—why nobody was sorting—until he recovered from his stupor he could not imagine.

CHAPTER XI.

CREWE.

WE have now reached the most important station on the London and North-Western Railway; indeed the works here are on a scale which strikingly exemplifies the magnitude of the arrangements necessary for the maintenance of an arterial railway.

The Company's workshops at Crewe consist of a Locomotive and of a Coach department. In the manufactories of the former are constructed as well as repaired the whole of the engines and tenders required for the Northern Division, namely, from Birmingham to Liverpool; Rugby to Stafford; Crewe to Holyhead; Liverpool to Manchester; Liverpool, Manchester, and Warrington to Preston; Preston to Carlisle. The establishment also "works," as it is termed, the Lancaster and Carlisle and Chester and Holyhead Lines. The total number of miles is at present 360, but the distance of course increases with the completion of every new branch line. In this division there are 220 engines and tenders (each averaging in value nearly 2000*l.*), of which at least 100 are at work every day. Besides repairing all these, the establishment has turned out a new engine and tender on every Monday morning since the 1st of January, 1848. The number of workmen employed in the above department is 1600, their wages averaging 3800*l.* a fortnight. The accounts
' these expenses, as also a book of "casualties," in which every
cident to, as well as every delay of, a train is reported, are
amined once a fortnight by a special committee of directors.

Without attempting to detail the various establishments, we will briefly describe a few of their most interesting features.

Close to the entrance of the Locomotive Department stands, as
ts *primum mobile*, the tall chimney of a steam-pump, which,

besides supplying the engine that propels the machinery of the workshops, gives an abundance of water to the locomotives at the station, as also to the new railway town of Crewe, containing at present about 8000 inhabitants. This pump lifts about eighty or ninety thousand gallons of water per day from a brook below into filtering-beds, whence it is again raised about forty feet into a large cistern, where it is a second time filtered through charcoal for the supply of the town. On entering the great gate of the department, the office of which is up a small staircase on the left hand, the first object of attention is the great engine-stable into which the hot dusty locomotives are conducted after their journeys to be cleaned, examined, repaired, or, if sound, to be greased and otherwise prepared for their departure—the last operation being to get up their steam, which is here effected by coal, instead of coke, in about two hours.

After passing through a workshop containing thirty-four planing and slotting machines in busy but almost silent operation, we entered a smith's shop, 260 feet long, containing forty forges all at work. At several of the anvils there were three and sometimes four strikers, and the quantity of sparks that more or less were exploding from each,—the number of sledge-hammers revolving in the air, with the sinewy frames, bare throats and arms of the fine pale men who wielded them, formed altogether a scene well worthy of a few moments' contemplation. As the heavy work of the department is principally executed in this shop, in which iron is first enlisted and then rather roughly drilled into the service of the Company, it might be conceived that the music of the forty anvils at work would altogether be rather noisy in concert. The grave itself, however, could scarcely be more silent than this workshop, in comparison with the one that adjoins it, in which the boilers of the locomotives are constructed. As for asking questions of or receiving explanations from the guide, who with motionless lips conducts the stranger through this chamber, such an effort would be utterly hopeless, for the deafening noise proceeding from the riveting of the bolts and plates of so many boilers is distracting beyond description. We almost fancied that the workmen must be

aware of this effect upon a stranger, and that on seeing us enter they therefore welcomed our visit by a charivari sufficient to awaken the dead. As we hurried through the din, we could not, however, help pausing for a moment before a boiler of copper inside and iron outside, within which there sat crouched up—like a negro between the decks of a slave-ship—an intelligent-looking workman holding with both hands a hammer against a bolt, on the upper end of which, within a few inches of his ears, two lusty comrades on the outside were hammering with surprising strength and quickness. The noise which reverberated within this boiler, in addition to that which was resounding without, formed altogether a dose which it is astonishing the tympanum of the human ear can receive uninjured; at all events we could not help thinking that, if there should happen to exist on earth any man ungallant enough to complain of the occasional admonition of a female tongue, if he will only go by rail to Crewe and sit in that boiler for half an hour, he will most surely never again complain of the chirping of that "cricket on his hearth"—the whispering curtain-lectures of his *dulce domum*.

The adjoining shop contains a brass and also an iron foundry, in which were at work seven brass-moulders and five iron-moulders. In the corner of this room we stood for a few moments looking over the head and shoulders of a fine little boy who was practically exemplifying the properties of the most wonderful of the mineral productions of nature—the loadstone. Among the mass brought into this workshop to be recast are occasionally a quantity of brass shavings and other sweepings, among which there is a small proportion of iron filings, &c. The little boy's occupation consisted in constantly stirring up the mass or mess before him with a magnet, which, as often as it came out bristling with resplendent particles of iron of various sizes, he swept clean, and then continued his work until the investigator came out of the heap as clear of iron as it went in.

Close to this shop is one in which the models and patterns of the castings are constructed. From a spacious open yard covered with stacks of old scrap-iron, much of which was of the size of common buttons, a door opens into a large shop containing

twelve forges solely used for the construction of engine-wheels, which are forced on as well as off their axles by an ingenious machine of extraordinary power. Adjoining the open yard we saw in operation Nasmyth's great steam-hammer, on the summit of which there sat perched up a man who could regulate its blow from say twenty-five tons to a little tap sufficient only to drive a common-sized nail. As soon as the furnace-door on one side of this hammer was opened, a large lump of scrap-iron at a white heat was lifted and then conducted by a crane on to the anvil beneath. At the same moment from an opposite furnace a long iron bar, heated only at one extremity, was by a gentle blow of the hammer no sooner welded to the mass than the head smith, using it as a handle, turned and re-turned the lump on the anvil so as to enable the steam-hammer to weld its contents into proper form. Of course there has been selected for this extremely heavy work the strongest man that could be obtained. He is of about the height and bulk of the celebrated Italian singer Signor Lablache, with apparently the strength of Hercules, or rather of Vulcan himself—and certainly nothing could be a finer display of muscular power than the various attitudes which this heavy man assumed, as, regardless of the sparks which flew at him, or of the white heat of the lump of iron he was forging, he turned it on one side and then on the other, until at a given signal a small smith in attendance placed a sort of heavy chisel on the iron handle, which by a single blow of the steam-hammer was at once severed from it, in order that it might be piled away and another mass lifted from the fiery furnace to the anvil.

Close to this Cyclopean scene there is a shop solely for turning wheels and axles, which, brought here rough from the smiths' forges we have described, never leave this place until they are ready to go under the engine for which they have been made.

After passing through a grinding-shop and a coppersmith's shop, which we must leave without comment, we entered a most important and interesting workshop, 330 feet in length, by 60 feet in breadth, termed the "fitting-shop," because the work brought here in various states is all finally finished and fitted for its object. Besides 11 planing-machines, 36 shaping and slotting ma-

chines, and 30 turning-lathes, all working by steam-power, we observed, running nearly the whole length of the building, five sets of tables, at which were busily employed in filing, rasping, hammering, &c., eight rows of "*vice-men*," only so called because they work at vices. The whole of the artificers in this room are of the best description, and the importance of their duties cannot perhaps be more briefly illustrated than by the simple fact that, besides all the requisite repairs of 200 locomotive engines, they were employed in finishing the innumerable details of 30 new ones in progress. Some were solely engaged in converting bolts into screws; some in fitting nuts; some in constructing brass whistles; in short, in this division of labour almost every "vice man" was employed in finishing some limb, joint, or other component part of a locomotive engine destined to draw trains either of goods or passengers.

After visiting a large store-room, in which all things appertaining to engines, sorted and piled in innumerable compartments, are guarded by a storekeeper, who registers in a book each item that he receives and delivers, we will now introduce our readers to the climax of the establishment, commonly called "*the Erecting-shop.*" Hitherto we have been occupied in following in tedious detail from the foundry to the forge, and from the anvil to the vice, the various items, such as plates, rivets, bolts, nuts, rings, stays, tubes, ferrules, steam-pipes, exhausting-pipes, chimney-pipes, safety-valves, life-guards, axle-boxes, pistons, cylinders, connecting-rods, splashers, leading and trailing wheels, &c., amounting in number to 5416 pieces, of which a locomotive engine is composed. We have at last, however, reached that portion of the establishment in which all those joints, limbs, and boilers, which have been separately forged, shaped, and finished in different localities, are assembled together for the consummation of the especial object for which, with so much labour and at so great an expense, they have been prepared: indeed, nothing, we believe, can be more true than Mr. Robert Stevenson's well-known maxim—"*A locomotive engine must be put together as carefully as a watch!*"

The Erecting-shop at Crewe is a room 300 feet long by 100

feet broad, containing five sets of rails, upon three of which are erected the new engines and tenders—the other two being usually occupied by those under heavy repair. The number of artificers we found employed was 220. In this magnificent building we saw in progress of erection 20 passenger-engines, also 10 luggage-engines; and as this shop has (as we have before stated) turned out a locomotive engine and tender complete on every Monday morning for very nearly a year, and is continuing to supply them at the same rate, we had before us in review locomotive engines in almost every stage of progress; and when we reflected on the innumerable benefits, and even blessings, which resulted to mankind from their power, it was most pleasing to be enabled at one view to see—as it were in rehearsal behind the scenes—performers who were so shortly to appear upon the stage of life.

At the further end of the line of rails close to the north wall there appeared a long low tortuous mass of black iron-work, without superstructure or wheels, in which the form of an engine-bed in embryo could but very faintly be traced; a little nearer was a similar mass, in which the outline appeared, from some cause or other, to be more distinctly marked; nearer still the same outline appeared upon wheels: to the next there had been added a boiler and fire-box, without dome, steam-escape, or funnel-pipe; nearer still the locomotive engine in its naked state appeared, in point of form, complete:—and workmen were here busily engaged in covering the boiler with a garment about half an inch thick of hair-felt, upon which others were affixing a covering of inch deal-plank, over which was to be tightly bound a tarpaulin, the whole to be secured by iron-hoops. In the next case the dome of the engine was undergoing a similar toilette, excepting that, instead of a wooden upper garment, it was receiving one of copper. Lastly—(it was on a Saturday that we chanced to visit the establishment)—there stood at the head of this list of recruits a splendid bran-new locomotive engine, completely finished, painted bright green—the varnish was scarcely dry—and in every respect perfectly ready to be delivered over on Monday morning to run its gigantic course. On other

rails within the building were tenders in similar states of progress; and, as the eye rapidly glanced down these iron rails, the finished engine and tender immediately before it seemed gradually and almost imperceptibly to dissolve, in proportion to its distance, until nothing was left of each but an indistinct and almost unintelligible dreamy vision of black iron-work. On one of the furthest rails, among a number of engines that were undergoing serious operations, we observed "*The Colonel*," which, by going off the rails at Newton Bridge, caused the death of General Baird.

Coach Department.

As our readers will no doubt feel some little selfish interest in the construction of the railway-carriages in which they travel, we shall conclude our rapid survey of the Company's workshops at Crewe by a short inspection of the coach establishment. This department constructs and maintains for the traffic on 393 miles of rails all the requisite passenger-carriages, luggage-vans, travelling post-offices and tenders, parcel-vans and parcel-carts, milk-trucks (principally to supply Liverpool), and break-waggons.

At the Company's "Waggon Department" at Manchester are constructed and maintained all the requisite goods-waggons, horse-boxes, coke-waggons, carriage-trucks for private carriages, cattle-waggons and timber-trucks.

The total number of carriages of all descriptions maintained at Crewe amounts to 670, of which about 100 at a time are usually in hospital. There are generally from 30 to 40 new carriages in progress: the number of workmen employed was 260. The establishment is divided into one set of workshops for the construction, and another for the repair of carriages.

1. In a large shop, 300 feet in length, warmed by steam, at night lighted by gas, and by day from lofty windows on each side, there is throughout the whole length of the building a wooden pavement containing eight sets of rails, upon which we beheld, like hackney-coaches on their stands, a variety of carriages in various stages of construction and of alteration, each surrounded by several intelligent artificers, who, instead of throwing away

their time in dancing round a tree of liberty, to the tune, or, as it is poetically termed by M. Lamartine, "the dogma" of liberty, fraternity, and *equality*, were sedulously occupied in framing different sorts of carriages to suit the various gradations of human society. For instance, one set, with beautiful colours, were painting the outside of a "first class;" while their comrades within were padding it, and petting it, and stuffing it, as if its object were to fit every bend and hollow in the human frame. Another set were strongly varnishing the wooden oak-painted interior of a "second-class," whose exterior had evidently received considerable attention; while another gang were "finishing off" a covered "third-class," whose inside certainly appeared not only very hard, but what old nurses term "terribly troubled with wind."

In another quarter a set of workmen were economically converting an old first-class into a second-class—the transmutation being effected by taking out the lining, and then converting large, fashionable, oval windows into little vulgar square ones. But though comfort, like cheese, bacon, or any other description of merchandise, was thus doled out to each class of passengers according to the amount of it which they may desire to purchase, the materials of all the carriages appeared to be of good sound quality. The panels of first, second, and third-class carriages, as well as those even of luggage-vans, are invariably made of mahogany; "the bottom-sides" of English oak; the rest of the framing of ash. The break-blocks are made of willow, and usually last about ten weeks' work. Adjoining this congregation of carriages is a smith's shop, containing twenty-eight forges and a tire-oven; above which we found a large store-room filled with lace-trimming, horse-hair, superfine cloth, varnished oil-cloth, nails, rugs, and, among a variety of other requirements, plate-glass for windows. We observed that those for the front glasses of coupés—in order to enable them to resist the occasional pelting of hot cinders from the engine—were half an inch thick! There was also, in an adjoining store, a collection of old cushions, mercilessly indented and worn out by some description of dull heavy pressure.

2. The hospital of the Coach Department at Crewe is an

enormous shed, 600 feet long by 180 broad. It is capable of holding 90 carriages, with ample room for working around them, but only 80 were under repair. Among them we observed several flying post-offices and tenders bearing the Royal arms. Adjoining is a large smith's shop, also a spacious yard containing a heavy stock of timber piled under sheds, with an office for recording the daily amount received and delivered. On entering "*the Grease house*," which, contrary to expectation, we found to be as clean as a dairy, we perceived, standing against the walls, three huge casks of Russia tallow, a quantity of yellow palm-oil, several boxes of soda, and a water-cock. On the opposite side there was a small steam-boiler for heating two open cauldrons and two wooden cooling-vats. This apparatus is constructed for the fabrication of that yellow mixture which our readers have seen bestowed so generously to the axles of the carriages of every train. We had often in vain endeavoured to ascertain its composition, which, from the grease-master, the highest possible authority on the subject, we at last discovered to be as follows :—

200 lbs. of Russia tallow.
70 lbs. of palm-oil.
20 lbs. of soda.
50 gallons of water.

Besides heating the two cauldrons we have mentioned, large iron pipes pass from the steam-boiler to the immediate vicinity of two casks, each containing one ton of sperm-oil, which is thus kept constantly fluid, instead of crystallizing, as it is prone to do, during cold weather.

CHAPTER XII.

A Railway Town.

Having now concluded our rough sketch of the workshops of the locomotive and coach departments at Crewe,—in both of which the Company's artificers and workmen toil both winter and summer from six in the morning till half-past five in the evening, except on Saturdays, when they leave off at four,—our readers will, we hope, feel sufficiently interested in their welfare to inquire, as we anxiously did, a little into their domestic history and comforts. About a hundred yards from the two establishments we have just left there stands a plain neat building, erected by the Company, containing baths, hot, cold, and shower, for the workmen, as well as for their wives and daughters, the hours allotted for each sex being stated on a board, which bluntly enough explains that the women may wash while the men are working, and *vice versâ*. For this wholesome luxury the charge for each person is 1½*d.*; and although we do not just at present recollect the exact price of yellow soap per bar, of sharp white sand per bushel, of stout dowlas-towelling per yard, or the cost of warming a few hundred gallons of water, yet, as we stood gazing into one of these baths, we could not help thinking that if that Hercules who works the steam-hammer can, on Saturday night after his week's toil, be scrubbed perfectly clean and white for three half-pence, he can have no very great reason to complain, for surely, except by machinery, the operation could scarcely be effected much cheaper! To a medical man the Company gives a house and a surgery, in addition to which he receives from every unmarried workman 1*d.* per week; if married, but with no family, 1½*d.* per week; if married, and with a family, 2*d.* per week; for which he undertakes to give

attendance and medicine to whatever men, women, children, or babies of the establishment may require them. A clergyman, with an adequate salary from the Company, superintends three large day-schools for about three hundred boys, girls, and infants. There is also a library and mechanic's institute, supported by a subscription of about 10*s.* a year, at which a number of very respectable artificers, whose education when young was neglected, attend at night to learn, *ab initio*, reading, writing, and arithmetic. There is likewise a vocal and instrumental class, attended by a number of workmen, with their wives and daughters.

The town of Crewe contains 514 houses, one church, three schools, and one town-hall, all belonging to the Company; and as the birth, growth, and progress of a railway town is of novel interest, our readers will, we think, be anxious to learn at what speed our railway stations are now turning into towns, just as many of our ancient post-houses formerly grew into post-towns. Although the new houses at Crewe were originally built solely for railway servants, yet it was soon found necessary to construct a considerable number for the many shopkeepers and others who were desirous to join the new settlement, and accordingly, of the present population of 8000, about one-half are strangers. Not only are the streets, which are well lighted by gas, much broader than those of Wolverton, but the houses are, generally speaking, of a superior description, and, although all are new, yet it is curious to observe how insidiously old customs, old fashions, old wants, and even old luxuries, have become domiciled. Many of the shops have large windows, which eagerly attempt to look like plate-glass. In the shoemakers' shops, contrasted with thick railway boots and broad railway shoes, there hang narrow-soled Wellingtons and Bluchers, as usual scarcely half the gauge or breadth of the human foot. The Company's workmen began by having a cheap stout dancing-master of their own; but the aristocracy of Crewe very naturally requiring higher kicks, we found a superior and more elegant artist giving lessons in the town-hall —a splendid room capable of containing 1000 persons.

It would of course be quite irregular for 8000 persons to live together without the luxury of being enabled occasionally to bite

and tickle each other with the sharp teeth and talons of the law, and accordingly we observed, appropriately inscribed in large letters on the door of a very respectable looking house,

GRIFFIN, ATTORNEY.

Mankind are so prone to draw distinctions where no real differences exist, that among our readers there are probably many who conceive that, although they themselves are fully competent to enjoy Fanny Kemble's readings from Shakspeare, such a mental luxury would be altogether out of character at *New Crewe!* In short, that shops full of smiths and other varieties of workmen (particularly him of the steam-hammer, and most especially the artificer we saw squatted in the boiler), although all exceedingly useful in their ways, could not possibly appreciate the delicate intonations of voice or the poetical beauties to which we have alluded. Now, without the smallest desire to oppose this theory, we will simply state, that while, during the men's dinner-hour, we were strolling through the streets of Crewe, we observed on the walls of a temporary theatre, surrounded by a crowd of gaping mouths and eager unwashed faces, a very large placard, of which the following is a copy :—

BY PARTICULAR DESIRE.

MR. JONES WILL REPEAT

The Scene from Macbeth and Cato's Soliloquy:

LIKEWISE

IMITATIONS OF CHARLES KEMBLE, EDMUND KEAN, AND MR. COOPER.

The town and shops of Crewe are well lighted by gas from the Company's works, which create about 30,000 cubic feet per day —the foot-paths of the streets being of asphalt, composed of the

Company's coal-tar mixed up with gravel and ashes from the workshops. The town is governed by a council of fifteen members, two-thirds of whom are nominated by the workmen and inhabitants, and one-third by the directors. Their regulations are all duly promulgated "by order of the council."

Although our limits do not allow us to enter into many statistical details, we may mention that the number of persons employed on account of the London and North-Western Railway Company, including those occupied in the collection and delivery of goods, is as follows:—

2	Secretaries to the Board of Directors.
1	General Manager.
3	Superintendents.
2	Resident Engineers.
966	Clerks.
3054	Porters.
701	Police-constables.
738	Engine and Firemen.
3347	Artificers.
1452	Labourers.
Total number 10,266	

The number of horses employed is . 612
Ditto vans, &c. 253

CHAPTER XIII.

Electric Telegraph.

In strolling down Lothbury, in the City of London, the stranger suddenly sees, opposite to the dull dead wall of the Bank of England and pointing down an alley, the forefinger of a little black hand, under which are written the following words:—

"To the Central Telegraph Station."

and accordingly, at the bottom of the small *cul-de-sac* there it stands, appropriately designated by its "Electric Clock."

On entering the door of this establishment the visitor suddenly finds himself in a very handsome reception-hall, 53 feet long, 32 broad, and 45 feet high, illuminated from above by a skylight, which also gives light to three galleries, one above another, communicating with the various departments of the establishment.

Across this reception-hall, on the left of which are the secretary's and accountant's offices, there is at each side a long counter or table, that on the right being divided by green curtains into six desks, at which are to be seen the round, stout, slight, slim backs of persons of all shapes, and occasionally of both sexes, intently occupied in writing—unseen by each other—the important communications they are severally desirous to despatch. These messages are required to be written on a half-sheet of large-sized letter-paper, nearly one half of which is pre-occupied by a printed form, to be filled up by the name and address of the writer, as also of the person to whom his communication is addressed; the charge of the message, answer, porterage, or cab-hire; the date and hour at which the message is received; and lastly, the date and hour at which the operation of conveying it was commenced and finished by the person who works the electric instrument.

On glancing at these forms our first impression was that the space allotted for the letter or message was insufficient. It is, however, practically found that the Company's charges, which amount, from, say London—

To Birmingham or Stafford	$3\frac{8}{10}d.$	per word.
„ Derby, Norwich, Nottingham, or Yarmouth	$4\frac{1}{8}$	„
„ Liverpool, Leeds, Manchester . . .	$5\frac{6}{10}$	„
„ York	$5\frac{3}{8}$	„
„ Edinburgh	$7\frac{1}{8}$	„
„ Glasgow	$8\frac{3}{8}$	„

seriously admonish writers of all descriptions to be as brief as possible: indeed it is a very curious fact in natural philosophy that a lawyer under the Company's galvanic influence is suddenly gifted with a description of *clairvoyance* which enables him to write on any subject in a laconic style, which in his chambers he would consider, and would most conscientiously assure his client, to be utterly impracticable!

As fast as these messages are written, they are, one after another, passed through a glass window to a small compartment, or rather department, on the ground-floor, termed "*the Booking-office,*" where, after having been briefly noted and marked with their distinctive numbers, they are by the same hand put into a small box, a bell is then rung, and at the same instant up they fly, through a sort of wooden chimney, to the attic regions of the building, to "*the Instrument department;*" and as we slowly followed them by a staircase, on every landing-place of which we involuntarily paused for a moment or two to reflect on the wonderful process we were about to witness, we own it was with admiration and surprise that, on entering the attic, we suddenly saw before us the simple materials with which such astonishing effects are produced.

In most of our manufactories it may but too truly be said that "the workmanship exceeds the materials." Before a common coffin-nail can be made, the bowels of the earth must be ransacked, ores raised in Cornwall must be smelted in Wales by coals which have been excavated, raised, carted, recarted, &c. The amount of labour which has been expended in the fabrication

of every trifling commodity exhibited in our shops is in a similar manner almost incalculable: indeed if our countrywomen did but know how many hours of unwholesome and unremitting application have been required, nay, how many constitutions have been ruined, in the fabrication of the light beautiful dresses and trinkets that adorn their persons, they would surely feel that their dance, delightful as it may have appeared to them, has been that of death to many of the poorest of their sex. Even the tedious details of the trifling volume we are writing prove that, while the public are luxuriously flying along the rails of only one arterial railway, an army of upwards of ten thousand workmen are labouring in a variety of ways for the management, protection, and maintenance of the way; and as we were not insensible of the usual necessity for these details, we certainly did expect to find that a proportionate amount of labour would be requisite for the simultaneous transmission of messages with extraordinary velocity to distances from one to upwards of four hundred miles. Simplicity, however, is the characteristic of science, and certainly the attics or garrets of the London Central Telegraph Station strikingly illustrate the truth of the axiom: indeed the whole of the Company's stock in trade which we found therein consisted of four or five intelligent-looking boys, from fourteen to fifteen years of age, and eight little "*instruments*," each about half the size of those which German women and Italian men carry on their backs through our streets; and as our advertising horse-dealers, in offering, or, as it is technically termed, in *chaunting* their cob to the notice of "a heavy timid gentleman," invariably assure him "that a child can ride it," so it may truly be said of the electric telegraph, which transmits its intelligence at the incomprehensible rate of 280,000 miles *per second*, that *a boy can guide it!*

Although the ordinary rate at which electric communication is now effected has above been easily expressed by a few figures, it is evident that it is a velocity which the human mind has not power to comprehend.

When Shakspeare, in the exercise of his unbounded imagination, made Puck, in obedience to Oberon's order to him—

" be here again
Ere the leviathan can swim a league,"

reply—

" I'll put a girdle round the earth
In forty minutes "—

how little did our immortal bard think that this light, fanciful offer of " a fairy " to " the king of the fairies," would, in the 19th century, not only be substantially realised, but surpassed as follows.

The electric telegraph would convey intelligence more than twenty-eight thousand times round the earth while Puck, at his vaunted speed, was crawling round it only *once!*

On every instrument there is a dial, on which is inscribed the names of the six or eight stations with which it usually communicates. When much business is to be transacted, a boy is necessary for each of these instruments; generally, however, one lad can without practical difficulty manage about three; but as the whole of them are ready for work by night as well as by day, they are incessantly attended in watches of eight hours each by these satellite boys by day, and by men at night.

As fast as the various messages for delivery, flying one after another from the ground floor up the chimney, reach the level of the instruments, they are brought by the superintendent to the particular one by which they are to be communicated, and its boy, with the quickness characteristic of his age, then instantly sets to work.

His first process is, by means of the electric current, to sound a little bell, which simultaneously alarms all the stations on his line; and although the attention of the sentinel at each is thus attracted, yet it almost instantly evaporates from all excepting from that to the name of which he causes the index needle to point, by which signal the clerk at that station instantly knows that the forthcoming message is addressed solely to *him*, and accordingly by a corresponding signal he announces to the London boy that he is ready to receive it. By means of a brass handle affixed to the dial, which the boy grasps in each hand, he now begins rapidly to spell off his information by certain

twists of his wrists, each of which imparts to the needles on his dials, as well as to those on the dials of his distant correspondent, a convulsive movement designating the particular letter of the telegraphic alphabet required.

By this arrangement he is enabled to transmit an ordinary sized word in three seconds, or about twenty per minute. In case of any accident to the wire of one of his needles, he can, by a different alphabet, transmit his message by a series of movements of the single needle at the reduced rate of about eight or nine words per minute.

While a boy at one instrument is thus occupied in transmitting to—say Liverpool—a message written by its London author in ink which is scarcely dry, another boy at the adjoining instrument is, by the reverse of the process, attentively reading the quivering movements of his dial, which by a sort of St. Vitus's dance are rapidly spelling to him a message, *viâ* the wires of the South-Western Railway, say from Gosport, which word by word he repeats aloud to an assistant, who, seated by his side, writes it down (he receives it about as fast as his attendant can conveniently write it) on a sheet of paper, which as soon as the message is concluded descends to the "Booking Office;" where, inscribed in due form, it is without delay despatched to its destination by messenger, cab, or express, according to order. The following trifling anecdotes will not only practically exemplify the process we have just described, but will demonstrate the rapidity with which the Company are enabled to transmit messages.

Some little time ago, a gentleman, walking into the reception-hall of the London office, stated that he had important business to communicate to his friend at Edinburgh, who by appointment was, he knew, at that moment waiting there to reply to it in the Company's Telegraphic Office. On being presented with the half-sheet of paper, headed with its printed form as described, he wrote his query, which, after passing through the glass window to "the Booking Office," flew upwards to the Instrument department, from whence with the utmost despatch it was transmitted to Edinburgh, and, the brief reply almost instantly

returning to the instrument, it was committed to writing, and then lowered down to the "gentleman in waiting," who thus quietly walked off with his answer, which we were informed at the office he obtained within the space of five minutes, a considerable portion of which had been consumed by himself and his friend in writing the few words which had passed between them, for, during their passage and return, the electric wires had only detained them exactly the three hundred and fiftieth part of one second!

In a dull foggy day an engine on the London and North-Western Railway, tired of idly standing still with its steam up, suddenly ran away, and, without any one to guide it, proceeded at a rapid rate towards the Euston Station, where every one who witnessed its start expected it would create an amount of damage almost incalculable: but the electric telegraph, soon overtaking and passing the fugitive, conveyed intelligence to Camden Station in abundant time for full preparations to be made there for its reception, by turning the points of the rails into a sideway containing only a few ballast waggons.

In like manner a "gentleman" who had taken for himself and his family only second-class tickets, but who with them had been comfortably enjoying a first-class carriage, was greatly astonished on arriving at his destination to see standing at the window of his carriage, almost before the train had stopped, the Company's station clerk, who very loudly said to him, in presence of his fellow-travellers, "*Mr.* ———, *I'll trouble you for excess of fare for yourself and party!*"

Besides the transmission of *private* messages at charges averaging, say one-fortieth of a penny per mile per word, the Electric Telegraph Company have, in central situations in the principal towns of the kingdom, established stations, whence and where information, messages, and despatches of a public character may be forwarded and received to and from all the other stations of the Company.

In each of these stations a room for subscribers has been established, in which is posted as fast as it arrives all intelligence of commercial or public interest; such, for instance, as—

Prices of Funds and Shares.
Money-market.
Wind and Weather from about forty different parts of the kingdom.
Shipping arrivals and departures.
Losses and disasters at sea.
Sporting intelligence.
Corn-market.
Corn averages.
Cattle-market.
Haymarket.
Meat-market.
Coal, tallow, cotton, and iron markets.
General-Produce market.
General news of the day.
Parliamentary news during the Session.

It need hardly be stated that this intelligence is principally imparted to the various stations from London, where it is concentrated by telegraphic announcements from all quarters.

The "Intelligence Department," which is distinct from the "Private Message Department," is solely for supplying news to the country subscription-rooms at Edinburgh, Glasgow, Liverpool, Leeds, Manchester, Hull, Newcastle, &c.

At 7 in the morning the superintendent of the former department obtains all the London morning newspapers, from which he condenses and despatches to the several electric stations the intelligence he considers most useful to each. The local press of course awaits the arrival, and thus by 8 o'clock A.M. a merchant at Manchester receives intelligence which the rails can only bring at ½ before 2, and which cannot by rail reach Edinburgh till ½ past 9 P.M.

To Glasgow is transmitted every evening detailed intelligence for immediate insertion in the 'North British Daily Mail,' giving everything of importance that has occurred since the first edition of the London papers. Similar intelligence is despatched to papers at Hull and Leeds.

By this rapid transmission of intelligence, the alternations in the prices of the markets at Manchester, &c. &c., being almost simultaneous with those of London, the merchants of the former are saved from being victimized by the latter. It is true that by great exertions prior intelligence may electrically be sent by private message; but as the wary ones cautiously wait for the despatch of the Telegraph Office, it has but little effect.

At one o'clock information is sent to all the electric reading-rooms of the London quotations of funds and shares up to that hour, thus showing the actual prices at which business has been done. The closing prices of the French funds for the day preceding are usually annexed, and the state of the London wind and weather at that hour.

Early in the morning the instrument boys are to be seen greedily devouring (for, with the curiosity, eagerness, and enthusiasm of youth, they appear to take great interest in their duties) the various matters which from all quarters at once are imparted to them.

One has just received intelligence by telegraph from Ely, announcing the result of the Lynn election. Another, a copy of a 'Moniteur' extraordinary, containing the first message of the President of the French Republic to the President of the National Assembly.

Another, that "Stewart's and Hetton's were nineteen and six-"pence. Gosforth eighteen shill. Holywell fifteen and six-"pence. Hastings Hartley fourteen and ninepence. S Q—"market one hun. fifty one, sold one hun and three—S Q.

"Market very good—P Q."

Another, the following characteristic description of the winds and weather of Old England at 9 A.M.:—

Places.	Wind.	Weather.
Southampton	W.S.W.	Cloudy.
Gosport	S.E.	,,
Portsmouth	S.E.	,,
London	E.	Rain.
St. Ives	W.	Very fine.
Cambridge	S.W.	Cloudy.
Newmarket	E.	Cloudy.
Yarmouth	E.	Fine.
Lowestoffe	E.	Stormy.
Norwich	E.	Fine.
Chelmsford	N.E.	Cloudy.
Colchester	S.E.	Fine.
Ipswich		Fine.

The above description of our changeable climate, it occurred

to us, would not very incorrectly represent the present political state of Europe.

During the day telegraphic information flashes upon these boys *from the* STOCK EXCHANGE, informing them of "prices and closing prices of the funds and principal railway shares. With remarks."

FROM THE LONDON CATTLE MARKET, stating "the number and quality of beasts, sheep, calves, pigs. *Holland* beasts, sheep, calves. *Danish* beasts. With remarks."

FROM THE MEAT MARKET, stating "the prices of every description of meat, with remarks."

Also similar returns from all the other markets we have enumerated.

As fast as this incongruous mass of intelligence arrives, it is, in the mode already described, transcribed in writing to separate sheets of paper, which are without delay one after another lowered down to the superintendent of "*the Intelligence Department*," by whom they are rapidly digested for distribution either to the whole of the Company's reading-room stations, or for those lines only which any particular species of information may partially interest; such as corn-markets requiring corn intelligence; seaports, shipping news, &c. &c.

As quickly as these various despatches are concocted, the information they respectively contain reascends through "the lift," or wooden chimney, to the instrument department, from whence it is projected, or rather radiates, to its respective destination; and thus in every one of the Company's reading-rooms throughout the kingdom there consecutively appears, in what would until very lately have been considered magic writing upon the walls, the varied information which had only reached London from all points of the compass *a few minutes ago!* But not only does this wonderful power, which it has pleased the Almighty to develop to mankind, facilitate in a most extraordinary degree our communication with each other, and thereby materially adds to our wealth, but it affords us a proportionate increase of power to defend that property which, by integrity and industry, our nation has, under Providence, been enabled to acquire.

In case of war, our Commander-in-Chief would not only be made acquainted with information even of the smallest importance as soon as, or even before, it reached our shores, but he would simultaneously be enabled to issue orders to the troops at every station in the kingdom as rapidly as if they were all assembled on the parade before him.

In like manner the Admiralty would receive intelligence and despatch directions, which, in combination with the arrangements at the Horse Guards, War Office, and Home Office, would give to our naval, military, and civil forces a combined strength which it has hitherto been impracticable for them separately to develop.

But to whatever amount the electric telegraph, used in the manner we have described, may facilitate the commerce and strengthen the defences of the empire, there remains to be delineated an application of the discovery which, there can be no doubt, forms the most extraordinary feat which the ingenuity of man has hitherto performed.

In a corner of one of the attics in which the eight electric instruments are placed there stands a small very ordinary-looking piece of cheap machinery composed of a few wheels, giving revolution to a small cylinder, upon which there has been wound a strip of bluish paper half an inch wide and about 60 yards in length.

As this insignificant thread of paper slowly unrolls itself, the stranger observes, with feelings of curiosity rather than of surprise, that as it passes along a small flat surface it receives from a little piece of steel wire about a quarter of an inch long, and about the size of a large needle, a series of minute black marks, composed of "dot and go one,"—two dots,—two dots and a line,—two lines and a dot,—three little lines and a dot,—and so on.

Now many of our readers will, no doubt, gravely exclaim, *But who makes these dots?*

The answer in a few words explains the greatest mechanical wonder upon earth. The little dots and lines marked upon the narrow roll of paper revolving in a garret of the London Central Telegraph Station, are made BY A MAN SITTING IN MANCHESTER,

who, by galvanic electricity, and by the movement of a little brass finger-pedal, is not only communicating to, but is HIMSELF actually PRINTING IN LONDON information which requires nothing but a knowledge of the dotted alphabet he uses to be read by any one to whom it may either publicly or confidentially be addressed ! !

Upon this fact comment is unnecessary. It humbles rather than exalts the mind. Of such an invention it can only be said

"NON NOBIS, DOMINE, SED NOMINI TUO DA GLORIAM."

To supply this instrument with paper there has been invented one of the most beautiful little toys we ever beheld, consisting of two iron fluted rollers four feet long, which, by revolving against each other, draw between them on one side, and emit from the other in a shower of fantastic writhing shreds, a hundred strips of paper half an inch broad at a time.

Before leaving the attics in which the electric printing as well the eight telegraphic instruments are stationed, we may observe that the boys who work the latter form that amount of acquaintance with the workers of the distant instruments with which they have been in the habit of communicating, that, if from any reason their usual correspondents are removed, they instantly discover by the movement of the needles that they have to form an acquaintance with a new comrade, from whom, in leisure moments, they probably soon ascertain the fate of the old one ; indeed, so completely is this description of acquaintance established, that it is not uncommon to hear a telegraph boy in the London attic suddenly exclaim, as he looks with joy at the quivering vibrations of his needles, which are working say from Manchester, "*Oh ! here is Bill * * * come back !*" There are, of course, however, exceptions to these kindly feelings, and accordingly two clerks who had been employed at remote stations on the * * * line were lately separated because they were constantly electrically quarrelling and abusing each other by telegraph.

The working of these instruments requires, as may be supposed, undivided attention, and accordingly there is very properly affixed to the wall of the chamber in which they stand the following notice, which we implicitly obeyed :—

"*Do not interrupt the clerks while engaged at the instruments.*"

As the Vicar of Wakefield's most important movements in life were "from the blue bed to the brown one," so we must now request our readers to migrate with us from the attics of the Electric Telegraph Office to a low, dark, groined, 5th-of-November-looking cellar, thirty-two feet long by five in width, containing three shelves, on which are to be seen, lying in double rows, thirty-four galvanic batteries, or, to speak in more homely terms, small open troughs, five inches broad, and either thirty-two inches or twenty inches in length. The largest, weighing, when charged, 60 lbs., are called "twenty-fours," because they contain that number of pairs of plates of copper and zinc separated by a little sand, the whole being then brought into galvanic action by being sluiced with sulphuric acid and water mixed in the proportions of one of the former to twelve of the latter.

The smallest, called "twelves," contain only that number of pairs of plates.

Of these batteries it requires from four to six of the largest to be applied to one instrument to blow a message from London to Edinburgh. A single "twelve," applied to each instrument, will project intelligence to a range of four or five miles.

These batteries are connected with the eight instruments in the attics by small copper wires, which, to prevent confusion of action from contact one with another, are covered with cotton thread, saturated with a mixture of tar, rosin, and grease.

With this simple precaution, nine wires, insulated from each other, are packed in a half-inch leaden tube, in which they again descend from the instruments to the cellar region. Four or five of these pipes are there packed into an iron pipe three inches in diameter, which conducts them under the foot pavement of the streets to the termini of the arterial rail-roads, alongside of which, and in the open air, a series of lines resembling those on which music is written, composed of galvanised iron, stout enough to bear tension, and suspended by posts, have, as is well known, been constructed. Along the street pavement, at every quarter of a mile, there are cast-iron "*testing-posts*" to enable the Com-

pany's servants to examine all these wires in order to detect and remove any that require to be renewed.

Although the London police have strict orders to allow no one to impede the thoroughfare of the public, and accordingly are everlastingly mumbling the unphilosophical monotonous exhortation of "*Get on, Sir!*" "*Move on, Ma'am!*" yet it is almost impossible for any ruminating being to walk the streets without occasionally pausing to reflect not only on the busy bustling scenes which glide before his eyes, but on those which, at very different rates, are at the same moment flowing beneath his feet.

In our metropolis, there is scarcely a street which does not appear to take pride in exposing as often as possible to public view a series of pipes of all sizes, in which fire of various companies, pure water of various companies, and unmentionable mixtures, abominable to all, pass cheek by jowl with infinitely less trouble than the motley human currents flow above them. But among all the subterranean pipes laid bare before us there is certainly no one which has more curious contents than the three-inch iron pipe of the Electric Telegraph Company; and yet, of all the multitudes who walk the streets, how few of them ever care to reflect what a singular contrast exists between the slow pace at which they themselves are proceeding, and the rate at which beneath their feet forty-five electric wires are transmitting in all directions, and to a variety of distances, intelligence of every possible description!

How singular is it to reflect that, within the narrow space of the three-inch iron pipe which encases them, notice of a murder is flying to London papers, passing news from India going into the country; along another wire an officer is applying for his regimentals, while others are conducting to and fro the "price of stocks," "news of the Pope," a speech from Paris of the "collapsed poet," &c. &c. &c. In case, from the abrasion of the cotton that surrounds the numerous copper wires within the pipe, any of them come into contact with each other, the intelligence which each is conveying is suddenly confounded; in which case other wires must instantly be substituted. Indeed,

even as regards the strong galvanised iron wires which in the open air run parallel with our arterial railways, if in wet weather, in spite of the many ingenious precautions taken, the rain should form a continuous stream between the several wires and the ground, the electric fluid, escaping from the wires, is conducted by the water till it "finds earth," the best of all conductors; and therefore, instead of the intelligence going on, say to Edinburgh, it follows the axiom of electricity by selecting the shortest road, and, thus completing its circuit through the earth, it returns to London. Sometimes, instead of going "to earth," it flies back to the office in London along another wire, to which, by means of a continuous line of water or of entanglement of the two wires, it has managed to escape; in which case, the messages on both wires wrangling with each other, the communication is stopped.

It is commonly asserted and believed that many birds are killed by merely perching upon the iron wires of the electric telegraph; but at any time they can do so with perfect impunity. If, indeed, a bird could put one of his feet on the wire, and with the other manage to touch the earth, he would then, no doubt, be severely galvanised. That the railway company's men often pick up under the wires of the electric telegraph partridges and other birds which have evidently been just killed—indeed, some are found with their heads cut off—is quite true; but these deaths and decapitations have proceeded, not from electricity, but from the birds—probably during twilight or fog—having at full speed flown against the wires, which, of course, cut *their* heads off, just as an iron bar would cut off the head of any man or alderman on horseback who, at a full gallop, was to run foul of it.

In windy weather the electric wires form an Eolian harp, which occasionally emits most unearthly music. "*I say, Jack!*" said an engine-driver to his stoker, who, like himself, was listening for the first time to this querulous sort of noise proceeding from the newly erected wires along his line, "*I say, Jack! a'n't they a giving it to 'em at Thrapstone?*"

When the posts and wires of the electric telegraph between

Northampton and Peterborough were being erected, an honest farmer, who for many minutes had very attentively been watching the operation, inquired of the chief superintendent to what use it was to be applied? On being informed that by its means he would in a few minutes receive *at Wellingboro'* a list of the Mark Lane prices *in London*, he evidently incredulously asked how that was to be done; and on its being explained to him that the intelligence would be sent down to him "*letter by letter*," he exclaimed, "But you don't mean to say that, besides letters, it will bring down *parcels* too?"

As the rails and electric wires are now immediately before us, we cannot refrain from observing that the two inventions, like all branches of science, not only materially assist each other, but that the former, to a considerable degree, has created the latter: for instance, it may be truly said that Mr. M'Adam materially assisted the invention of the innumerable little four-wheeled carriages which burst into existence as soon as, in consequence of good roads, it became possible for a single horse to draw a whole family. In like manner, it may, we submit, be reasonably and fairly asserted that the gradients and police of the railway have materially assisted the invention, or rather the application, of galvanic electricity to wires, which, placed along unguarded high roads, would have been practically useless.

On the outside of the Central Telegraph Station, as well as in the interior, there is an electric clock, the latter of which is worked by a small battery contained in a white jar capable of holding about three quarts, and, the pendulum being operated upon by combined electricity with galvanism, the clock requires no winding up, and would, therefore, go perpetually, or rather as long as the battery lasts; and if the Company would, instead of gas-burners, adopt the electric light, their establishment would then, *sui generis*, be complete.

Considerable instruction, with some little amusement, might, no doubt, be derived from a perusal of the variegated information, intelligence, and ordinary as well as extraordinary private

messages which have been despatched and recorded by the electric telegraph; but the Company very properly faithfully refuse—be it important or unimportant—to unveil to any one what they consider to have been confidentially intrusted to their care.

Those, however, who have recourse to the invention often divulge their own secrets; and accordingly here is one which came to us direct from one of the parties concerned.

During a marriage which very lately took place at ———, one of the bridesmaids was so deeply affected by the ceremony, that she took the opportunity of the concentrated interest excited by the bride to elope from the church with an admirer. The instant her parents discovered their sad loss, messengers were sent to all the railway stations to stop the fugitives. The telegraph also went to work, and with such effect that, before night, no less than four affectionate couples legitimately married that morning were interrupted on their several marriage jaunts, and most seriously bothered, inconvenienced, and impeded by policemen and magistrates, who

> "Like envious clouds seem'd bent to dim their glory,
> And check their bright course to the Occident."

On the other hand, when it is considered that young people who form imprudent attachments, instead of being effectually separated, as in old-fashioned times, by distance, can now-a-days, though four or five hundred miles apart, at any moment, by daylight or by moonlight, electrically converse with each other—in short, ask questions and give answers—it must be admitted that, although the galvanic telegraph has certainly triumphantly succeeded in stopping many matches, it has possibly, if the real truth could be known, made quite as many as it has marred.

With respect, however, to communications of this delicate nature, we deem it our duty very gravely to warn our young readers, especially those of the fairer sex, that unless London time were to be adopted—as it is—at all the electric stations, a despatch would arrive at its western destination at an earlier hour than that at which it had left its eastern starting-post;

and thus a young lady might appear to have affirmatively answered in Devonshire an important question—say seven minutes and a half before, according to local clocks, it had actually been proposed to her in London!

In cases where crimes have been committed, the astonishing detective powers of the telegraph have already proved most valuable to the community. As, however, the numberless instances which might be cited are but endless exemplifications of the same principle, we will merely offer to our readers the fragment of one of them.

. . . . . .

He never expected that! . . . . . He had made up his mind to give her the stuff,—he had deliberately bought it,—had paid for it,—had put it into his pocket,—had driven with it to the terminus of the Great Western Railway,—had flown with it along the line to Slough,—had walked with it to the cottage.

He had already deprived the poor creature of her character, and now, on the first day of the year 1845, he had come down to her on purpose to deprive her of her life.

With affected kindness he had offered her refreshment,—had waited while, with his money, she went to buy it,—he had summoned up courage?...no, cowardice and wickedness... enough secretly to pour the stuff from a tiny phial into her glass,—he had seen her, with feelings of gratitude to him, raise the mixture to her faded lips,—he had watched her swallow the first mouthful—then another—then drink,—he had expected every instant, as she reached the drugs, to see his degraded victim drop down dead before his eyes;—he could bear all this, but he did not know that it was the nature of the horrid poison he had purchased to betray the hand that administered it. Oh! he never expected that loud, horrid, piercing, convulsive scream!

As terrified and scared he opened the door to escape, the inhabitants of the neighbouring cottages, alarmed by the frightful noise they had just heard, sympathetically opened theirs. They saw him leave the house with hurried steps,—observed him make for the Slough road, where by another party he was

observed to be "confused—to tremble—and on being addressed, to make no reply." And yet he had only done what he had deliberately intended to perpetrate:—he knew there was no rest for the wicked, but, Oh! he had never expected that shrill, fearful, haunting scream!

On reaching the station he took his place in a departing train, and in a few minutes he apparently had effected his escape!

Everybody who has travelled by the Great Western Railway knows how joyously its well-appointed trains skim along the level country between Slough and London. He no doubt appreciated the speed—valued the wings with which he was flying—more than any of his fellow-passengers. He probably felt that no power on earth could overtake him, and that, if he could but dive into the mass of population in London, he would in perfect security flow with its streams unnoticed.

But whatever may have been his fears—his hopes—his fancies—or his thoughts, there suddenly flashed along the wires of the electric telegraph which were stretched close beside him the following words:—

"A MURDER HAS JUST BEEN COMMITTED AT SALTHILL, AND THE SUSPECTED MURDERER WAS SEEN TO TAKE A FIRST-CLASS TICKET FOR LONDON BY THE TRAIN WHICH LEFT SLOUGH AT 7H. 42M. P.M.

"HE IS IN THE GARB OF A QUAKER, WITH A BROWN GREAT-COAT ON, WHICH REACHES NEARLY DOWN TO HIS FEET. HE IS IN THE LAST COMPARTMENT OF THE SECOND FIRST-CLASS CARRIAGE."

And yet, fast as these words flew like lightning past him, the information they contained, with all its details, as well as every secret thought that had preceded them, had already consecutively flown millions of times faster; indeed, at the very instant hat, within the walls of the little cottage at Slough, there had een uttered that dreadful scream, it had simultaneously reached he judgment-seat of Heaven!

On arriving at the Paddington Station, after mingling for ıe moments with the crowd, he got into an omnibus, and as

it rumbled along, taking up one passenger and putting down another, he probably felt that his identity was every minute becoming confounded and confused by the exchange of fellow-passengers for strangers that was constantly taking place. But all the time he was thinking, the Cad of the omnibus—a policeman in disguise—knew that he held his victim like a rat in a cage. Without, however, apparently taking the slightest notice of him, he took one sixpence, gave change for a shilling, handed out this lady, stuffed in that one, until, arriving at the Bank, the guilty man, stooping as he walked towards the carriage-door, descended the steps;—paid his fare;—crossed over to the Duke of Wellington's statue, where pausing for a few moments, anxiously to gaze around him, he proceeded to the Jerusalem Coffee House,—thence over London Bridge to the Leopard Coffee House in the Borough,—and finally to a lodging-house in Scott's Yard, Cannon Street.

He probably fancied that, by making so many turns and doubles, he had not only effectually puzzled all pursuit, but that his appearance at so many coffee-houses would assist him, if necessary, in proving an *alibi;* but, whatever may have been his motives or his thoughts, he had scarcely entered the lodging when the policeman—who, like a wolf, had followed him every step of the way—opening his door, very calmly said to him—the words no doubt were infinitely more appalling to him even than the scream that had been haunting him—

"HAV'NT YOU JUST COME FROM SLOUGH?"

The monosyllable "NO," confusedly uttered in reply, substantiated his guilt.

The policeman made him his prisoner;—he was thrown into jail;—tried;—found guilty of wilful murder;—and—HANGED.

A few months afterwards, we happened to be travelling by rail from Paddington to Slough, in a carriage filled with people all strangers to one another. Like English travellers, they were all mute. For nearly fifteen miles no one had uttered a single word, until a short-bodied, short-necked, short-nosed, exceedingly respectable-looking man in the corner, fixing his eyes on

the apparently fleeting posts and rails of the electric telegraph, significantly nodded to us as he muttered aloud—

"THEM'S THE CORDS THAT HUNG JOHN TAWELL!"

Having now concluded a rough outline of the practical working of the electric telegraph, it is necessary that we should state—as an important fact on which we offer no comment—that the Company has made arrangements with all the railway companies for working their wires, excepting with the South-Eastern, and, accordingly, that the electric communication between London and Dover is worked by itself, and without connexion with the general system.

The wires of the electric telegraph from the various lines of railway, carried under the streets, and concentrated at the central station in London, transmit private messages and answers to and from the following places:—

Acklington.	Brandon.	Croft.
Alne.	Brentwood.	Darlington.
Alnwick.	Bridlington.	Derby.
Ambergate.	Brick Lane.	Dereham.
Apperby.	Brockley Whins.	Dorchester.
Ardleigh.	Brockenhurst.	Duffield.
Ashchurch.	Bromsgrove.	Droitwich.
Attleborough.	Brough.	Dunbar.
Audley End.	Broxbourne.	Durham.
Aycliffe.	Burton-on-Trent.	Estrea.
Ayton.	Calverley.	Eckington.
Barking Road.	Cambridge.	Edinburgh.
Barnsley.	Castleford.	Edmonton.
Beeston.	Chelmsford.	Elsenham.
Belford.	Cheltenham.	Ely.
Belmont.	Chesterfield.	Fence houses.
Belper.	Chesterford.	Ferry hill.
Bentley.	Chittisham.	Flaxton.
Berwick-on-Tweed.	Church Fenton.	Gateshead.
Beverley.	Clay Cross.	Glasgow.
Birmingham.	Cockburnspath.	Gloucester.
Bishopstoke.	Colchester.	Gosport.
Blackwall.	Colwich.	Granton.
Bradford.	Cowton.	Grantshouse.
Braintree.	Crewe.	Haddington.

Halifax.
Harecastle.
Harling Road.
Harlow.
Helpstone.
Hertford.
Hessle.
Howden.
Hull.
Ilford.
Ingatestone.
Ipswich.
Kegworth.
Keighley.
Kildwick.
Kelvedon.
Kirkstall.
Lakenheath.
Leamside.
Leeds.
Leicester.
Leith.
Lesbury.
Lincoln.
Linlithgow.
Linton.
Liverpool.
London.
Longeaton.
Longniddry.
Longport.
Long Stanton.
Longton.
Loughborough.
Lowestoffe.
Maldon.
Malton.
Manchester.
Manea.
Manningtree.
March.
Masbro'.
Melton.
Mildenhall.
Mile End.
Milford.
Morpeth.
Newark.
Newcastle.
Newmarket.
Newport.
Normanton.
Northallerton.
Norton Bridge.
Norwich.
Nottingham.
Oakenshaw.
Oakington.
Otterington.
Peterborough.
Ponder's End.
Poole.
Portsmouth.
Rillington.
Raskelf.
Reston.
Richmond.
Ringwood.
Rochdale.
Romford.
Rotherham.
Roydon.
Royston.
Rugby.
Sawbridgeworth.
Scarborough.
Selby.
Sessay.
Sheffield.
Shelford.
Shipley.
Skipton.
Slough.
Southampton.
South Shields.
Spetchley.
Stamford.
Stanstead.
Staveley.
St. Ives.
St. Margaret's.
Stoke-on-Trent.
Stone.
Stortford.
Stratford.
Stratford Road.
Sunderland.
Swinton.
Syston.
Tamworth.
Thetford.
Thirsk.
Todmorden.
Tottenham.
Tranent.
Trentham.
Tring.
Tweedmouth.
Ullesthorpe.
Uttoxeter.
Wakefield.
Waltham.
Ware.
Wareham.
Washington.
Waterbeach.
Waterloo Station.
Watford.
Whitacre.
Whittlesea.
Whittlesford.
Wimbourne.
Winchburgh.
Wingfield.
Wisbeach.
Witham.
Wolverton.
Woolwich.
Worcester.
Wymondham.
Yarmouth.
York.

CHAPTER XIV.

RAILWAY CLEARING-HOUSE.

IT is a curious fact that human ignorance, and especially good honest homespun English ignorance, often produces important and highly beneficial results. "*If I had but known what I have had to contend with I would never have undertaken the job,*" is a remark which many a poor emigrant, many a weary traveller, many a journeyman labourer in every department of life, has fervently muttered to himself. The ejaculation is particularly applicable to the original projectors of our railways, who, had they but known the hydra-headed difficulties which, one after another, they would have to encounter, would most surely have kept their money in their pockets, or, in the phraseology of the vulgar, "would never have undertaken the job."

Besides the difficulty of raising money, which during the railway mania certainly amounted to *nil*, there were parliamentary difficulties, engineering difficulties, difficulties of management of various descriptions; and yet, when all these were overcome, when each railway, with its beautiful system of committee-men, secretaries, engineers, surveyors, station-masters, engine-drivers, stokers, pokers, guards, police, superintendents, artificers, labourers, &c., was fully organised and completed, and every line competent along the whole or any portion of its length convey with safety and due attention every description of ffic, there suddenly appeared a new difficulty, which not only st seriously embarrassed, but which threatened almost to pre- nt, the combined action of the vertebral railways which at uch trouble and cost had just been created. The difficulty ded to was what is now commonly called "the *through* c."

Even before the railway system came into full operation, it was soon found, that to conciliate, or rather to satisfy the just claims of the passenger public, it would be necessary not to harass warm "through" travellers by forcing them to migrate to cold carriages as often as, asleep or awake, dozing or dreaming, they reached each terminus of the various railway companies who, in enmity rather than in partnership, were the proprietors of the consecutive portions of the thoroughfare line.

Again, it was soon found that our merchants and manufacturers as justly insisted rather than requested that their goods and merchandise should go "*through*" to their destinations without being subjected to the delay and serious injury which were unavoidable in repeatedly unpacking and repacking them into fresh waggons. Lastly, it was found that, for cattle and horses, changes of carriages were equally objectionable. The will of the people becoming, therefore, in these instances, the law of the rails, passengers, parcels, goods, horses, and cattle, were, generally speaking, carried "*through*" without change of carriage.

But though the traveller, the receiver of the parcel, of the package, of the horse, dog, bullock, sheep, or pig, after paying for the fare, of course cared not the hundred-thousandth part of a farthing what was done with the money, yet it will be self-evident that he left behind him sources of endless vexation and almost unpreventible disputes; for not only was the paltry fare he had paid for his own conveyance, or that which he might have paid for the conveyance of a lean pig, to be divided among the proprietors of two, three, four, five, six, or seven different companies, but of these companies all excepting one would have not only to remunerate by a mileage allowance the company in whose carriage or waggon, for the benefit of all parties, the traveller, or his parcel, or his goods, or his cow, calf, horse, dog, sheep, or sow, had been carried "through," but an extra charge for demurrage was evidently due to the said company for every day that its carriage or waggon had been detained by the companies to whom it did not belong. The railway companies between London and York first saw the absolute necessity of their endeavouring by some arrangement to settle accounts of this description, which

daily and hourly were growing up between them; but inasmuch as each company, from feelings of jealous independence, kept their books in a different form, dissensions arose, angry correspondence followed, until the settlement of their joint accounts was impeded by the most vexatious delays. The virulence of the disorder, however, was the means of its cure. Mr. Morison, the present very able manager and sole organiser of the new system, conceived the formation of a central office, and the idea was no sooner suggested to Mr. Glyn, the chairman of the London and North-Western Railway, than, seeing at a glance its practical bearing, he gave it the whole weight of his well-earned influence, and was mainly instrumental in the establishment of the astonishing system of minute detail which we will now endeavour very briefly to describe.

The Railway Clearing-House, which adjoins the right-hand side of the entrance-gate from Seymour Street to the Euston Station, is under the control of a committee composed of the chairmen of all the railway companies who are parties to the clearing arrangements; the expense of maintaining the establishment being divided rateably among the companies in proportion to the extent of business transacted by it for each.

On opening a street door, which a brass plate beamingly announces to be that of the "Railway Clearing-House," the stranger sees before him a long passage, on both sides of which are hanging, as if for sale, a variety of very decent-looking hats, cloaks, and coats, which he has no sooner passed than he finds himself in a spacious hall or office 78 feet long, 20 wide, and 26 feet high, in which, at one glance, he sees seated or standing before him, at 13 parallel desks, upwards of a hundred well-
ressed clerks, each silently occupied either in writing or in
parently carefully investigating that which others have written.
ıe stillness of the scene, to which the public have no admit-
nce, is very remarkable; and before we enter on the subject of
ne avocation of those before us, we cannot help observing that,
o any one who has lately had an opportunity of seeing the num-
of half-starved men in Paris who, with interminable mus-
ıios and noble bushy beards, are, with depressed heads,

intently engaged in a variety of occupations, down to that of—say—painting a tiny brooch to ornament the bosom of a lady's gown—it is amusing to contrast a body of such fierce-looking warriors "*à demi-solde*" with the plain, clean, close-shorn men of business, who throughout the United Kingdom are, week after week, month after month, and year after year, unassumingly labouring in behalf of that which republicans only talk of instead of attain—a commonwealth.

The business of the Railway Clearing-House is transacted by one manager and 110 clerks. The system comprehends 47 railway companies: in short, it extends to all railways north of the Thames—from Bristol, London, and Harwich, to Aberdeen; and it contains no less than 648 clearing-house stations, by the correspondence of which with the London clearing-office the accounts of the "through" traffic of all the companies is adjudged and settled.

The aforesaid business is divided into four departments:—

First, and most important, the goods and live-stock traffic.

Second, the coaching traffic.

Third, the mileage of carriages and waggons, as also the mileage of tarpaulins for covering waggons.

Fourth, lost luggage.

Goods.—From each of the 684 Railway Clearing-House Stations which we have enumerated, there is forwarded to the London office a "daily abstract of goods" (printed in black ink), containing the invoice, the amount carted, the sums paid or the sums to pay, the undercharge, the overcharge, and the description of the traffic "*forwarded*" each day from each station to each of the other stations enumerated in the return. Of these goods the gross total is composed of a number of articles, each of which, from the station from which it is forwarded, is charged according to the established rate agreed on by the companies for "through" goods. Some of these weights are only 14 lbs., in which case they, as well as every package below 56 lbs. (termed "a small"), are charged at a higher rate.

2. From each railway clearing station there is forwarded *daily* to the London office a return similar to the above (but for dis-

tinction printed in red ink), of the description, weight, &c. &c., of goods *received* at each station, and thus from two opposite points a detailed return of the amount of goods conveyed between them is declared.

3. As soon as these two returns (black and red) are received at the London office, they are carefully examined, to ascertain if the articles returned in each are correct—that is, if the declaration of the goods *despatched* corresponds with the return of the same goods from the point at which they should have been received. About 30 per cent., however, of the number of items in these returns do *not* correspond, the difference being sometimes a few pounds, sometimes a few pence. Ten clerks are constantly occupied in checking these two sets of returns.

4. As fast as these errors are detected, a "*statement of omissions and inaccuracies*" (in one month 7000 of these statements have been transmitted) are sent from the London office to both parties for explanation, and, when returned by each with "remarks," the errors are corrected according to their replies.

5. From the above accounts a division of the receipts of the goods traffic is made monthly; and as there are 4500 of these settlements (each on an average wanting 2½ copies), about 11,000 copies per month are required. These abstracts are for the following object:—All "*through*" goods arriving in London are by agreement charged with certain terminal expenses for carterage and porterage, which are about double those charged in the country. This monthly settlement, therefore, shows to every company concerned what each is entitled by mileage to receive from one or more companies,—what actually has been received by each,—and consequently the balance due from the one to the other. Hull alone, from its numerous connexions with other stations, receives on an average 200 of these monthly abstracts. Twenty-four clerks are constantly occupied in preparing them.

6. The next operation is, by a consideration of all these balances, to determine what the clearing-house, as the representative of all the creditor companies, is entitled to receive from the debtor companies. The final result of all these operations is exemplified by a monthly return forwarded by the office to each

of the forty-seven companies, showing separately to each, for each of its stations, the weights, the mileage proportions, the terminal expenses, and, lastly, the balances, whether due to it or by it, on the traffic from each of its stations to all other clearing-house stations to which goods had been sent, or from which received. The number of entries in these monthly summaries averages 11,186.

The above closes the account of the goods traffic. Any omission or errors in these accounts are corrected in those of the subsequent month, the balances being, in the first instance, always paid as declared by the London railway clearing-house.

When the balances are finally struck, a letter is addressed from the office to each company, advising it of the amount due to or by it on the traffic of the month; and, unless these balances are paid by each company within twenty-one days, interest at 6 per cent. is charged, and credited to the companies to whom the clearing-house is nominally indebted.

For the convenience of the companies a weekly notice is sent by the London office to each, informing each of the amounts of the receipts of the *through* goods traffic to which it is respectively entitled. This single operation, which enables the companies to publish their weekly receipts, employs nine clerks.

PASSENGERS.—All tickets collected at all the clearing-house stations from *through* passengers are transmitted daily to the London clearing-house, from whence, after being examined and compared with the returns of the tickets issued, they are sent back to the respective companies. From Euston, as well as from all other stations, passenger tickets for every station are each numbered separately from 1 to 10,000, and are issued consecutively, not only for each station, but for each *class* of passengers. In examining these collected tickets, which on an average amount to 9000 per day,—in comparing them with the consecutive numbers as entered in the daily Returns received from the various stations,—and in checking the consecutive numbers themselves, five clerks are employed. The railway clearing-office thus receives—

1. Return from Euston booking-office, as also from all clearing-house passenger stations, stating the number of passengers of each

class booked for all clearing stations, the portions of fares paid by each passenger and due to "foreign" companies.

2. From this account the London clearing-house prepares and forwards daily to each company a return, showing the portion of the fares received at Euston due to each respectively. The above returns are despatched on the evening of the second day.

3. The London clearing-house receives daily from every clearing station a similar return.

4. From these two sets of returns the debtor and creditor account of each company is made up, and kept separate in a book, from which a statement of balances is prepared and forwarded weekly to each company, showing the amount received on its account by the other companies, as also on account of the other companies by it, the balances due to it or by it, and the weekly balance due to or by the clearing-house on behalf of the companies. We may here observe that by the foregoing arrangements, without which the *through* passenger traffic could not possibly be practically carried out, 2,700,000 persons are annually saved the inconvenience of changing their carriage during their journey.

5. The same minute process is pursued with horses, carriages, and dogs, the tickets for which are numbered consecutively, and checked as for passengers. In this duty thirteen clerks are employed.

PARCELS.—The daily returns of the number of parcels despatched and received are checked, and the balance of receipts divided, precisely as the goods, with this addition, that a "way-bill" is sent by each train with the parcels for each station, showing the number of the parcel, the weight, address, and charge; similar bills being also sent from the receiving station to the clearing-house, thus constituting an additional check. For small parcels carried by the passenger-trains from London to Edinburgh the gross charge of 4*s.* is divided among four companies; small charges are often divided among seven companies; and in some cases a charge of 6*d.* is divided among two companies. In this duty eight clerks are employed.

At the end of the London Clearing-House three clerks are em-

ployed for the live-stock traffic, principally composed of lean stock going to be fattened, of fat cattle, pigs, sheep, and calves going to market. The rates for live stock, like those for goods, are agreed on by all the joint companies, and the returns are sent weekly to the clearing-house. The gross receipts, after deducting a small sum, per waggon, for terminal expenses, are divided, by mileage, among the companies (frequently six in number) concerned.

We have now to endeavour to explain a new branch of the department, termed "*Mileage Branch.*"

In 1848 no less than 443,604 loaded waggons were by various companies (averaging three in number) sent "*through*," besides 267,228 sent back empty. The course of each of these waggons the clearing-house had to trace, in order to ascertain the exact time each was detained on each railway.

The number of miles for which the companies received, through the London clearing-house, payment from each other, amounted to 45,580,384.

The manner in which these extraordinary results are effected is as follows :—

At every junction of railways there are stationed men in the pay of the London Clearing-House, to take the number of all passenger-carriages and goods-waggons, as also of all tarpaulins or sheets covering waggons. These men make to the clearing-office *daily* a detailed statement of the same.

Returns are also sent *daily* from all the clearing-house stations on all the lines of railway, by the servants of the respective companies, of all foreign carriages arriving and departing from each of the said stations. From these returns the London Clearing-House is enabled to trace the course of all waggons and passenger-carriages travelling on what are termed "foreign" lines, and to debit and credit every company with the sums it has respectively incurred for mileage, as also what is due from and to the respective companies for demurrage per day of waggons or of passenger-carriages.

These accounts are transmitted to each company monthly.

Sheets covering waggons are in like manner all checked at

the junctions by the men placed there by the London Clearing-House, as also by returns forwarded to the office from the various stations at which the waggon stops to be loaded or unloaded; and thus the charge of one-tenth of a penny per mile for the use of each of these tarred coverings is divided according to its proper proportion among the respective companies over whose lines it has travelled! For a waggon or carriage from Edinburgh to London, mileage and also demurrage accounts are sent to four companies, and from Arbroath to London to seven companies.

Fourteen clerks are required to keep the mileage and demurrage accounts of carriages and waggons, and eight clerks to keep those of the tarpaulins or sheets.

THE ACCOUNTANT.—Lastly, in the corner of the London office, in a small elevated compartment, about four feet square, sits "the Accountant," who keeps—

1. An account for each separate company (forty-seven in number), showing briefly the sums at their debits and credits, and the balance due to or by each.

2. An interest ledger, showing the amount of interest accruing on balances in arrear, which interest is received by the clearing-house from the Dr. company, and paid to the Cr. company.

3. By the Act of Parliament, every railway company is bound to pay to Government a duty on all sums received by it from passengers, whether on its own account or for other companies. The consequence of this is, that one company is continually obliged to pay duty for another, thus creating a debtor and creditor account for duties, which account the Clearing-House also settles monthly.

LOST LUGGAGE.—The Clearing-House, from its connexion with almost every railway in the kingdom, undertakes the duty of corresponding with all the clearing-house stations from which it receives *daily* returns respecting any unclaimed luggage left on the rails.

At the entrance of the Clearing-Office, in the corner, there is a post-office of compartments for the letters and returns transmitted by the manager to each company.

The office usually receives and despatches 4500 communications per day, employing five lads to open, endorse, and arrange them.

The office is open daily from 9 A.M. till 5 P.M.

With a deep sigh we can truly say that we have now concluded a sketch of the Railway Clearing-House, which, as it gave us one headache to investigate, and another to endeavour to explain, will probably be equally afflicting to our readers.

In justice, however, to the system, we must confess that it is impossible to convey in writing an adequate conception of the infinity of details with which it has to grapple.

The number of items which in the course of a year, by the London office, are examined, traced through many returns, checked, and transferred from one account to another, exceeds rather than falls short of (50,000,000) fifty millions!

It must be obvious to any person conversant with the working of railways, that, without a centralised system of this description, so constituted as to command the confidence of the railway companies, the railway system generally would not only soon become clogged, but constant squabbles and disagreements between the various companies would ensue, to the detriment of their interests, as well as to the discomfort and inconvenience of the public.

The true object, therefore, of the London Railway Clearing-House is to enable the railway companies of the United Kingdom who are parties thereto, to work that enormous traffic, in which they have a common interest, with as much security to themselves, and with as little inconvenience to the public, as if all the associated companies were ONE; and it is evident that in no way could this important object have been effected, except by the establishment of an office which, based on principles of complete centralisation, should be—as the London Clearing-House really is—independent of each company, but under the common control of ALL.

CHAPTER XV.

MORAL.

THE few rough sketches which we have now concluded, insignificant and trivial as they may appear in detail, form altogether a mass of circumstantial evidence demonstrating the vast difficulty as well as magnitude of the arrangements necessary for the practical working of great railways; and yet we regret to add, in their general management there exist moral and political difficulties more perplexing than those which Science has overcome, or which order has arranged.—We allude to a variety of interests, falsely supposed to be conflicting, which it is our desire to conciliate, and from which we shall endeavour to derive an honest moral.

When the present system of railway travelling was about to be introduced into Europe, it of course became necessary for Parliament and for His Majesty's Government seriously to consider and eventually to determine whether these great national thoroughfares should be scientifically formed, regulated, and directed by the State, under a Board competently organized for the purpose, or whether the conveyance of the public should be committed to the inexperienced and self-interested management of an infinite number of Joint-stock Companies. Without referring to by-gone arguments in favour of each of these two systems, and, above all, without offering a word against the decision of Parliament on the subject, we have simply to state that the joint-stock system was adopted, and that accordingly capitalists and speculators of all descriptions—men of substance and men of straw—were authorized at their own cost to create and govern the iron thoroughfares of the greatest commercial country in the world. The first result was what might naturally have been

expected, for no sooner was it ascertained that a railway connecting, or, as it may be more properly termed, tapping immense masses of population—such, for instance, as are contained in London, Bristol, Birmingham, Liverpool, Manchester, &c.—was productive of profit, than, just as, when one lucky man finds a rich lode, hundreds of ignorant, foolish people immediately embark, or, as it is too truly termed, *sink* their capital in "*mining*," so it was generally believed that any "*railway*"—whether it connected cities or villages it mattered not a straw—would be equally productive.

The competition thus first irrationally and then insanely created was productive of good and evil. The undertakings were commenced with great vigour. On the other hand, as engineering talent cannot all of a sudden be produced as easily as capital, many important works were constructed under very imperfect superintendence; and as iron, timber, and every article necessary for the construction of a railway simultaneously rose in value, the result was that the expense of these new thoroughfares, which by the exaction of fares proportionate to their outlay must, as we have shown,* eventually be paid for by the public, very greatly exceeded what, under a calm, well-regulated system, would have been their cost. Nevertheless, in spite of all difficulties and expenses, foreseen as well as unforeseen, our great arterial railways were very rapidly constructed.

Their managers, however, had scarcely concluded their "song of triumph," when they found themselves seriously embarrassed by a demand on the part of the public for what has been rather indefinitely termed "cheap travelling;" and as this question involves most serious considerations, we will venture to offer a very few observations respecting it.

There can be no doubt that, inasmuch as it is the duty of Parliament to legislate for the interests of the public, so it is the duty of Her Majesty's Government to exercise their influence in legitimately obtaining for the community *cheap* travelling. But although money is valuable to every man, his life is infinitely more precious; and therefore, without stopping to inquire whe-

* See Chapter I. page 17.

ther by cheap travelling is meant travelling for nothing, for fares unremunerative, or for fares only slightly remunerative to the Company, we submit as a mere point of precedence, that the *first* object the legislature ought to obtain is, that every possible precaution shall be taken to ensure for the public SAFE travelling.

Now, casting aside all petty or local interests, we calmly ask in what manner and by what means would Her Majesty's Government ensure for the public *safe* travelling, supposing our railways were the sole property of the State?

The answer is not only evident, but, we submit, undeniable.

The way, under Providence, to protect the public from avoidable accidents on railways is, utterly regardless of expense, to construct the rails, sleepers, locomotive-engines, and carriages of the very best materials, carefully put together by the best workmen; and then to intrust the maintenance of the line to engineers and other men of science of the highest attainments, assisted by a corps of able-bodied guards, pointsmen, and policemen, all sober, vigilant, active, intelligent, and honest.

Now it is highly satisfactory to reflect that every one of the above costly precautions, as well as all others of a similar nature which a paternal government could reasonably desire to enforce, are as conducive to the real interests of the proprietors of a railway as they are to the safety of those who travel on it; for even supposing that the Directors take no pride in maintaining the character of the national thoroughfare committed to their charge—that, reckless of human life, they care for nothing but their own pockets—a railway accident summarily inflicts upon their purses the same description of punishment instantaneously awarded to a man who carelessly runs his head against a post. For instance, only a few weeks ago a ballast-train on the London and North-Western Railway having stopped for a moment, a goods-train behind it ran into it. No one was hurt excepting the Company—who suffered a loss of 4000*l.* by the collision. Independent, therefore, of the heavy damages readily awarded by juries to any one hurt by a railway accident, the injuries self-inflicted by the Company on their own costly engines, carriages, &c., are most serious in amount, to say nothing of the almost incalculable

embarrassment they may create: indeed, taking into fair consideration the costly results which have occurred to our railway companies by the dislocation of a bolt, the unscrewing of a little nut, or from a variety of other causes equally trifling, it may, we believe, be truly said that the punishments which railway companies have received from accidents have, generally speaking, exceeded rather than fallen short of their offences; and thus every intelligent board of directors is aware that safety in travelling is more emphatically for the interest of railway proprietors than any other consideration whatever: in short, that there is nothing more expensive to a railway Company than an accident.

It being evident, therefore, that it is as much for the interests of railway proprietors as of railway travellers that every possible precaution should be taken by the Company to prevent accidents, we have now to observe that to attain all the necessary securities there is but one thing needful—namely, MONEY. With it Her Majesty's Government might conscientiously undertake the serious responsibility of prescribing all that Science could administer for the safety of the public. Without money, what government or what individual who had any character to lose could for a moment undertake that which his judgment would clearly admonish him to be utterly impracticable? Now, if this reasoning be correct, the managers of our arterial railways were certainly justified in expecting that, if the Government required them to take every possible precaution to ensure *safe* travelling, they would, as a matter of course, assist them in obtaining the same means which they themselves would require had they to effect the same object—namely, MONEY. But instead of endeavouring to obtain for railway companies these means—or rather, instead of enabling them to retain the means which, under their respective Acts of Parliament, they already legally possessed of purchasing security for the public, Parliament, in compliance with a popular outcry for *cheap* travelling, deemed it advisable to require from railways a reduction of the tolls necessary to ensure SAFE travelling.

To any one who will carefully observe the practical working of a railway, it is not only alarming, but appalling, to reflect on

the accidents which sooner or later *must* befall the public if the master-mind which directs the whole concern, but which cannot possibly illuminate the darkness of every one of its details, were suddenly to be deprived of the talisman by which alone he can govern a lineal territory four or five hundred miles in length—namely, an abundant supply of MONEY. Parliament may thunder—Government may threaten—juries may punish—the public may rave ; but if the fustian-clad workmen who put together the 5416 pieces of which a locomotive engine is composed are insufficiently paid—if the wages of the pointsmen, enginemen, and police be reduced to that of common labourers—if cheap materials are connected together by scamped workmanship—the black eyes, bloody noses, fractured limbs, mangled corpses of the public, will emphatically proclaim, as clearly as the hopper of a mill, the emptiness of the exchequer. So long as the manager of a railway has ample funds he ought to be prepared, regardless of expense, to repair with the utmost possible despatch the falling-in of a tunnel or any other serious accident to the works—in short, the whole powers of his mind should be directed to the paramount interests of the public, which, in fact, are identical with those of the Company. But if he has no funds—or, what is infinitely more alarming, in case, from want of funds, the impoverished proprietors of the railway shall have angrily elected in his stead the representative of an ignorant, ruinous, and narrow-minded policy—how loudly would the public complain—how severely would our commercial interests suffer, if, on the occurrence to the works of any of the serious accidents to which we have alluded, the new Ruler were to be afraid even to commence any repairs until he should have been duly authorised by his newly-elected economical colleagues to haggle and extract from a number of contractors the cheapest tender !

But we fear it would not be difficult to show that, in reducing the established rates of our great railways before their works were completed, Parliament has unintentionally legislated upon erroneous principles. For instance, we have already explained that the profit of a railway depends upon the amount of the population and goods which flow upon it from the towns it taps.

If, therefore, the traffic on an arterial line be but moderately remunerative, it must be evident that a branch line must be an unprofitable concern—unless, indeed, the company be authorized to levy upon it *higher* tolls than are sufficient on the trunk line. When, therefore, in the rapid development of our great national railway system it was found necessary for the accommodation of a fraction of the public to apply to Parliament for powers to make these unremunerating branch lines, the companies were certainly in theory entitled to expect the extra assistance we have explained;—instead of which they were practically informed that, unless they would consent to LOWER their tolls altogether, they would not be allowed to develop their system by the construction of any branch line; which is as if a tenant were to say to his landlord—"If you incur the expense of making convenient bye-roads to my farm to enable me with facility to take my crops to market, *you must lower my rent.*"

As it is undeniable that exorbitant rates, besides being inconvenient to the public, are highly injurious to the real interests of railway proprietors—indeed we have shown how enormously the traffic of the country has been increased by low charges—we would be fully disposed, not only most strongly to recommend, but, as far as it may be legal, to enforce, that salutary principle; but the insuperable difficulty of *at present* adjusting the proper tolls to be levied on the public is, that no arterial railway in Great Britain can either declare in figures, or even verbally explain, the real state of its ultimate expenditure and receipts, for the sole reason, namely, that the enterprise is not yet worked out, and that no man breathing can foretell what are to be its limits.

What has become, we ask, of the *old* London and Birmingham Railway (born only in 1836)—of the Grand Junction Railway—of the Manchester and Birmingham—the Liverpool and Manchester Railways—and of a score of others we could name? What has become of the civil, or rather uncivil, war which all these companies waged against each other; as well as against Messrs. Pickford, the most powerful carriers in the world? They have all lost the independence they respectively occupied, and, like the ingredients cast by Macbeth's witches "i' th'

"turned pot," they have "boiled," or, as it is now-a-days termed, amalgamated, into one great stock; and while this long continuous arterial line has been drawing from the public for goods and passenger traffic considerable receipts, it has been, and at various localities still is, draining its own life-blood by the forced construction of a number of sucking branch-lines, which, as far as we can see, are not likely ever to be remunerative.

For some time railway companies deemed it their interest to compete against each other, but this ruinous system was gradually abandoned and is now reversed. The two lines from London to Peterborough, after competing for several months, now divide their profits. The two lines to Edinburgh will probably ere long do the same. But besides this transmutation of competition into combination, public notice was lately given that three of the large arterial lines, namely, the Great Western, the South-Western, and the London and North-Western, were meditating an amalgamation of their respective stocks into one vast concern. On this important project, which for the present has been abandoned, we will offer a very few observations.

We believe it may be affirmed, without fear of contradiction, that the working details of a railway are invariably well executed in proportion to their magnitude:—that, for instance, in the management of the London and North-Western Railway the arrival and departure of trains are better regulated at their large stations than at their small;—that their great manufactories are better and more economically conducted than their little ones;—that the arrangements of Messrs. Pickford and of Messrs. Chaplin and Horne are better at Camden Town than at the small outlying stations;—in short, we most distinctly observed that wherever there was an enormous amount of important business to be transacted, *there* were invariably to be found assembled superior talents, superior workmen, superior materials; and that, on the other hand, at small and secluded localities, where little work was performed, inferior men, inferior waggons, horses, &c., were employed.

In the old system of travelling it was safer to drive along a nely road than through crowded streets; old horses as well as

old drivers were deemed safer than young ones; in fact, the more the traveller was impeded, the less dangerous was his journey. But on our railways, when once a man has tied himself to the tail of a locomotive engine, it matters but little, especially in a fog, whether he flies at the pace of fifty miles an hour, or whether he crawls, as it is now termed, at the rate only of twenty; for, in either case, if there be anything faulty in the works, machinery, or management, accidents may occur to him which it is fearful to contemplate.

Considering, therefore, that not only the ability necessary for the general management of a railway, but the intelligence and vigilance requisite at every station and on every portion of the line are found practically to increase according to the demand, and *vice versâ*, it is evident that nothing would prove more fatal to the public as well as ruinous to proprietors than to split an efficient remunerating great railway into two or more inefficient and unremunerating small ones. A little railway, like "a little war," is murderous to those engaged in it,—ruinous to those who pay for it; and we are therefore of opinion that it is for the interest of the public not only that traffic should be concentrated as much as possible on large lines, rich enough to purchase management, engineering, servants, and materials of the very best description, but that these great lines by uniting together should voluntarily force themselves to exchange all paltry considerations, mean exactions, and petty projects for those great principles which alone should guide the administration of a *national system* of railways. There can be no doubt that any description of monopoly is abstractedly an evil, but if it be equally true that every inch of railway throughout the country represents an integral portion of a vast legally constituted monopolizing system, the practical question to consider is, not whether monopoly is an evil, but whether, of two evils, it would be more or less convenient for Parliament and the public to deal with *one* monopoly than with *many*;—whether, for instance, it would be more or less easy for Government, in recommending alterations of fares, &c., to correspond solely with the directors of the London and North-Western Railway than to communicate *seriatim* with the

boards of the several companies to whom the present line originally belonged, each of which might possibly, in opposition to each other, be pursuing a different course of policy.

As the new system has created an enormous increase of traffic, so it has also, *pari passu*, developed talent proportionate to the extraordinary demand for it; and, therefore, whatever may be the imaginary dangers from a concentrated administration of our railways, we feel confident that the public have much greater reason to apprehend the inconveniences, to say the least, that must inevitably result to them from those sudden unreasonable changes of management, or rather of *mis*management, which are sure periodically to take place so long as every separate railway monopoly arbitrarily pursues not only its own system, but that which its restless shareholders from time to time may think proper to ordain. At all events, until the best plan of managing our great railways shall have been finally ascertained, and most especially until the unknown liabilities, expenses, and receipts attendant upon the establishment over the surface of our country of a series of iron highways shall have been accurately developed, it must be utterly impossible for any practical man to decide to what extent, if any, the Parliamentary tolls originally levied on the public ought in equity to have been reduced.

The great truth, however, sooner or later must appear; and as the hurricane, however violently it may blow, in due time is invariably succeeded by a breathless calm;—as the ocean waves, although mountain high, shortly subside;—as the darkest night in a few hours turns into bright daylight;—so must the present mystified prospects of our great railways inevitably ere long become clear and transparent as those of any other mercantile firm; and when this moment shall have arrived, we believe a very short time will elapse before Parliament, the amalgamated Railway Boards, and the public, will come to a creditable and amicable adjustment; for while, on the other hand, it can never be the interest of the public to prefer *cheap* to SAFE travelling, so it can never be the serious and fixed purpose of any body of men competent to direct the affairs of our arterial railways to exact from the public an exorbitant dividend which must inevitably create

condign punishment; for so sure as water finds its own level will British capital always be forthcoming to lower by legitimate competition anything like a continued usurious exaction from the public. But a moment's consideration of the following facts will show that, as regards railway tolls, the public have as yet no very great reason to complain.

1st. As regards the public:—

In 1835 the fares paid by the public for travelling from London to Liverpool, at the average rate of say 10 miles an hour, were, exclusive of fees to guards and coachmen—

	£.	s.	d.		£.	s.	d.
Per Mail, outside . . .	2	10	0	Inside . . .	4	10	0
Per Coach, ditto	2	5	0	Ditto . . .	4	5	0

In 1849 the fares paid by the public for travelling the same distance, at an average rate of 22½ miles per hour (the express trains travelling at about 30 miles per hour) are—

	£.	s.	d.
Per Express and per Mail trains	2	5	0
First Class	1	17	0
Second Class	1	7	0
Third Class	0	16	9

2ndly. As regards the proprietors of Railways:—

In Herapath's Railway Journal of the 30th of September last it appears that the capital expended on railways now open for traffic, amounting to 148,400,000*l.*, gives a profit of 1·81 per cent. for the half-year, or 3*l.* 12*s.* 4½*d.* per cent. per annum. Deducting the non-paying dividend lines, the dividend on the remainder amounts to 2·09 per cent. for the half-year, or 4*l.* 3*s.* 7½*d.* per cent. per annum.

After ten years' competition with railways the dividends received by the Canal Companies between London and Manchester were in 1846 as follows:—

	Per Cent.
Grand Junction Canal	6
Oxford	26
Coventry	25
Old Birmingham	16
Trent and Mersey	30
Duke of Bridgewater's (private property) say .	

The dividends received by the Grand Junction Canal for the last forty years have averaged 9*l.* 10*s.* 9*d.* per cent. per annum.

Great as have been and still are the advantages to the country of our inland navigation, it cannot be denied that the creation of railways was a more hazardous undertaking than the construction of canals. Without, however, offering any opinion as to the relative profits which it has been the fortune of the proprietors of each of these valuable undertakings to divide, we merely repeat that, considering the unknown difficulties which for some time must continue to obscure the future prospects of our railways, it is neither for their interest nor that of the public that the managers of these great national works should in the mean while be cramped by want of means in the development of the important system which it has pleased the Imperial Parliament to commit to their hands instead of to the paternal management of Her Majesty's Government.

If the present alarming depreciation of railway property continue, it is evident that decisive measures, good, bad, or indifferent, will be deemed necessary by the shareholders to prevent, if possible, further loss; and while, on the one hand, the public ought not to be alarmed at impracticable threats, it is only prudent to consider what will probably be the lamentable results of a civil or rather of an uncivilized warfare between the travelling public and the proprietors of the rails on which they travel.

In case the present reduced fares should prove to be unremunerative, we have endeavoured to show that, unless the shareholders in anger elect incompetent managers, the public have no reason to entertain any extra apprehension from accidents;—for the engine-driver might as well desire to run his locomotive over an embankment as a company of proprietors—almost all of whom are railway travellers—become reckless of their property as well as of their lives. Indeed, if railway rates were to be further reduced to-morrow, the public would, we believe, travel as safely, and perhaps even more so, than at present. The result of inadequate rates is not danger, but inconvenience, amounting to deprivation of many of those advantages which the railway system is calculated to bestow upon the country. For instance, to every

practical engineer it is well known that pace is just as expensive on rails as on the road. At present the public travel fast, and those who want to go long distances are accommodated with trains that seldom stop. If, however, it does not suit them to pay for speed, they cannot reasonably expect to have it. If railway companies, as well as the public, are forced to economise, both we believe would eventually be heavy losers by the transaction. The London and North-Western Company, by taking off their express trains, might at once save upwards of 20,000*l.* a-year, besides severe extra damage to their rails. The railways in general might reduce the number of their trains,—make them stop at every little station,—run very slow,—suppress the delivery of day-tickets,—curtail the expenses of their station accommodation,—and finally abandon a number of tributary lines upon which large sums of money have been expended. It must be for the public to determine whether, for the sake of a small saving in their fares, which after all are moderate as compared with other travelling charges,' they desire not only to forego the accommodation and convenience to which they have lately become accustomed, but to arrest the development of the railway system to its utmost extent, and with its development its profits.

But, whether our railways be eventually governed by high-minded or by narrow-minded principles,—by one well-constituted amalgamated board, or by a series of small disjointed local authorities,—we trust our readers of all politics will cordially join with us in a desire not unappropriate to the commencement of a new year, that the wonderful discovery which it has pleased the Almighty to impart to us, instead of becoming among us a subject of angry dispute, may in every region of the globe bring the human family into friendly communion; that it may dispel national prejudices, assuage animosities; in short, that, by creating a feeling of universal gratitude to the Power from which it has proceeded, it may produce on earth peace and good will towards men.

APPENDIX.

ALTHOUGH in describing the character of a dull man it is customary to say of him "*that he scarcely knows his right hand from his left*," yet, when it is considered that railway travellers are undoubtedly the cleverest portion of every community—indeed it is only very dull men or very dead ones that now-a-days travel in stage-coaches or in hearses—it is difficult to explain why millions of such travellers, highly intelligent on all other subjects, should have continued for so long a time, and should still continue, ignorant of important signals which are passing not only close on each side of, but immediately before, behind, and beneath them.

As the long dusty caravan full of human beings flying along its iron orbit skims across the surface of "merry England," its guard is continually receiving police signals—stationary signals—semaphore signals—junction signals—auxiliary signals—train signals—special signals—and detonating signals.

Every human being in the train may also see or hear them, and yet—whether for weal or woe—they are an alphabet which none of us can read—symbols which none of us can interpret—short-hand writing which none of us can decipher!

As an appropriate appendix, therefore, to our attempt to delineate the practical working of a railway, we offer to such of our readers as may be anxious "to read as they run" an Official explanation, not only of every signal exhibited on the London and North-Western Railway, but of the various orders given to the servants of the Company, for the purpose of protecting passengers of all classes from accident, injury, imposition, or insult.

It surely appears advisable for all parties that orders of this description should be made known to the public.

We annex them, therefore, without other comment than the mere statement of the fact that By Authority of the Board of Directors they have been very carefully collected—selected from the Orders of almost all the other Railway Companies—and compiled by the Company's "General Manager," Captain Huish.

RULES AND REGULATIONS

FOR THE

CONDUCT OF THE TRAFFIC,

AND FOR THE

GUIDANCE OF THE OFFICERS AND MEN

IN THE SERVICE OF THE

London and North-Western Railway Company.

LONDON, JANUARY, 1849.

INDEX.

At a Meeting of the Board of Directors, held on the 11*th of September*, 1847, *it was*

Ordered,

That the following code of Rules and Regulations be, and the same is hereby approved and adopted for the guidance and instruction of the Officers and Men in the service of the London and North-Western Railway Company, and that all former Rules and Regulations inconsistent with the same be cancelled.

Ordered,

That every person in the service do keep a copy of these Regulations on his person while on duty, under a penalty of five shillings for neglect of the same.

By order of the Board of Directors.

MARK HUISH,
General Manager,
London and North-Western Railway.

SECTION I.

GENERAL REGULATIONS

APPLICABLE TO ALL SERVANTS

OF THE

LONDON AND NORTH-WESTERN COMPANY.

1. Each person is to devote himself exclusively to the Company's service, attending during the regulated hours of the day, and residing wherever he may be required.

2. He is to obey promptly all instructions he may receive from persons placed in authority over him by the Directors, and conform to all the regulations of the Company.

3. He will be liable to immediate dismissal for disobedience of orders, negligence, misconduct, or incompetency.

4. No instance of intoxication on duty will ever be overlooked, and, besides being dismissed, the offender will be liable to be punished by a magistrate.

5. Any person using improper language, or cursing and swearing, while on duty, will be liable to dismissal.

6. No person is allowed to receive any gratuity from the public on pain of dismissal.

7. Any instance of rudeness or incivility to passengers will meet with instant punishment.

8. Every person receiving uniform must appear on duty clean and neat, and if any article provided by the Company shall have been improperly used, or damaged, the party will be required to make it good.

9. No Servant is allowed under any circumstances to absent himself from his duty without the permission of his chief Superintendent.

10. No Servant is allowed to quit the Company's service without giving *fourteen* days' previous notice. On leaving the service he must deliver up his uniform.

11. The Company reserve the right to deduct from the pay such sums as may be awarded for neglect of duty as fines, and for rent when the Servant is a tenant of the Company.

12. Should any Servant think himself aggrieved, he may memorialise the Board; but in any such case the memorial must be sent through the head of his department.

SECTION II.

SIGNALS.

RED is a Signal of **DANGER—STOP.**
GREEN „ **CAUTION—PROCEED SLOWLY.**
WHITE „ **ALL RIGHT—GO ON.**

These Signals will be made by **Flags** in the Daytime, and by **Lamps** at Night.

In addition to this, any Signal, or the arm, **waved** violently, denotes danger, and the necessity of stopping immediately.

POLICE SIGNALS.

1. When the Line is clear, and nothing to impede the progress of the Train, the Policeman on duty will stand erect, with his Flag in hand, but show no signal, thus—

2. If it be necessary to proceed with Caution, the Green Flag will be elevated, thus:—

3. If it be necessary to proceed with Caution from any defect in the rails, the Green Flag will be depressed, thus:—

4. If required to stop, the **Red** Flag will be shown and waved to and fro, the Policeman facing the Engine.

5. Engine-Drivers must invariably **Stop** on seeing the Red Signal.

6. As soon as the Engine passes, the Policeman will bring his flag to the shoulder.

7. Every Policeman will be responsible for having his **Hand Lamp** in good order and properly trimmed.

STATIONARY SIGNALS.

8. On a stopping Train, or one travelling slowly, passing an intermediate Station, the Red Signal will be shown for **Five minutes,** to stop the Engine of any following Train, when the Green Signal will be turned on for **Five minutes** more, to complete the ten minutes precautionary Signal: on the Liver-

pool and Manchester Line, the Red Signal will be turned on **Three** minutes only and the Green **Five.**

9. On an Express Train or single Engine passing, the Green Signal only need be shown for **Five minutes.**

10. The Red Signal will be shown while a Train is stopping at a Station, and for **Five minutes** after its departure, when the Green Signal will be turned on for **Five minutes** more.

11. On a Train entering a long Tunnel the **Red** Signal will be turned on for **Ten minutes,** or until the Policeman shall have received Telegraphic notice that the Train has emerged from the other end, when the **Green** Signal will be turned on to complete the precautionary Signal.

SEMAPHORE SIGNALS.

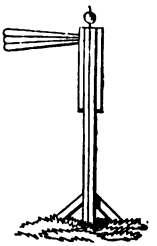
DAY.

1. The Signals are constructed with either ONE or TWO Semaphore Arms.

2. The Signal is *invariably made* on the **Left-Hand** Side of the Post as seen by the approaching Engine-Driver.

3. The **All Right** Signal is shown by the Left-Hand Side of the Post being clear, the Arm being within the Post, thus:—

4. The **Caution** Signal, to slacken speed, is shown by the Semaphore *Arm* on the Left-Hand Side being raised to an angle of 45 Degrees, thus:—



5. The **Danger** Signal, always to stop, is shown by the *Arm* being raised to the Horizontal position, thus:—

When the two Arms are raised both Lines are blocked.

(*Semaphore Signals.*) **NIGHT.**

6. The Arm and the Lamp are both worked with the same hand lever, and at the same time.

7. The **All Right** Signal is shown by the **white** Light.

8. The **Caution** Signal by the **green** Light.

9. The **Danger** Signal by the **red** Light.

JUNCTION SIGNALS.

10. Every Junction is provided with Two Semaphore Signal Posts, corresponding with the two meeting Railways; and the *Signals* for each Line are shown on the *Signal* Post appropriated to it.

11. The Signals for Caution and Danger, by Day and Night, are shown in the same way as on the Station Signal Posts.

12. The Semaphore Arms and the Lamps for DAY and NIGHT Signals at the Junctions are always set at **DANGER**, and no Engineman is allowed to pass without the Arm is lowered to **CAUTION**, or the **Green** Light is shown by the Lamp.

N.B. At the Junctions there are no **ALL RIGHT** Signals, as it is necessary in passing them to go cautiously and slow.

AUXILIARY SIGNALS.

13. At many of the principal Stations, Auxiliary Signals, worked by a wire, are placed 500 yards in advance of the Station Signal Post. These Auxiliary Signals are intended to warn the Enginemen and Guards in thick weather (when the

main Signal cannot be well seen at the usual distance) of the **Red** being turned on at the Station, and for this purpose a **Green** Signal is shown at the Auxiliary Post. Except when the Red Signal is shown at the Station, no Signal whatever is shown by the Auxiliary. The Enginemen are not to depend solely upon the Auxiliary Signals; but they may always depend on the **Red** Signal being on at the Station whenever the **Green** is seen at the Auxiliary.

TRAIN SIGNALS.

14. Every Engine with a Passenger Train shall carry a **White** Light on the Buffer Plank by Night, and every Cattle, Merchandize, or Coal Train, a **Green** Light.

15. In order to distinguish the Trains while running on the Liverpool and Manchester Branch, the Grand Junction Passenger Trains will carry **two** White Lights, and the Merchandize Trains **two** Green Lights, between Liverpool and Warrington, and the North Union Passenger Trains will carry a **Blue** instead of a White Light on the Buffer Plank of Passenger Trains, and a **Blue** in addition to the Green Light on the Merchandize and Coal Trains.

16. Every Train, after sunset or in foggy weather, shall carry one or more **Red Tail Lights**, according to the description of the Train.

17. The Guard of the Train is responsible for attaching the Tail Lamps on the last carriage or waggon, and the Engine-Driver and Fireman for placing the Lamp on the Engine. When a carriage is detached at a Junction, care must be taken to see that the Tail Light is removed, and re-attached to the Train.

18. The Tail Signal must be inspected at **every Station**; and in the event of the Train being brought to a stand on the Main Line from any cause, the Guard must take care that no one stand before the Tail Lamp, so as to prevent its being seen.

19. A **Red Board** or Flag by Day, or an **extra** Tail Lamp by Night, hung at the back of an Engine or Train, denotes that an **extra Train** is to follow.

SPECIAL SIGNALS.

NEWTON JUNCTION.

20. By Night a **Green** Light, visible from either of the Liverpool and Manchester Main Lines, denotes that the points are open for Trains going towards Warrington.

21. When a Grand Junction Train from Liverpool is approaching the Junction Points at Newton Junction, at the same time that a Train from Manchester for Liverpool is also approaching, Signals must be given to **both Trains to stop**; and if there is any doubt that there will be danger of collision in the Grand Junction Train crossing the Liverpool South Line, the Pointman must **not** turn the points for the Line to Warrington, but must let the Grand Junction Train run past the points towards Manchester.

22. Whenever the line at Newton Junction is obstructed, or an Engine or Waggon is being shunted, the attention of the Pointmen on the Liverpool and Manchester Line must be called to the circumstance by **ringing the Bells** at the top of the Incline. **Two Bells** are fixed for the Pointmen at the Junction, whereby Signals may be exchanged between them and the Grand Junction Pointman.

23. Whenever a Train is ascending the Warrington Incline, whether for Liverpool or Manchester, at the same time that a Train from either of those Stations for Warrington is approaching Newton Junction, the Pointman will stop the **latter** until the former Train has passed the curve; he will also take care that an interval of not less than **five minutes** is allowed between the passing of any two Trains towards Warrington.

24. If, when any Liverpool and Manchester Second Class Train has arrived at the Warrington Junction, a Birmingham Train is seen coming up the Warrington Inclined Plane, the Engineman must stop, and allow the Birmingham Train to **pass before him** to Liverpool.

25. If the Birmingham Coach Train overtake a Liverpool and Manchester Second Class Train more than 3 miles distance from Liverpool, the Second Class Train **must shunt,** if there be an opportunity, to allow the Birmingham to pass.

N.B.—The same rule applies equally to Third Class Trains.

SECTION III.

DIRECTIONS FOR THE USE OF DETONATING SIGNALS IN FOGGY WEATHER.

1. These Signals are to be placed on the Rail (label upwards), by bending the lead clip round the upper flange of the Rail, to prevent its falling off. When the Engine passes over the Signal, it explodes with a loud report, and the Driver is instantly to stop.

2. The use of Fog Signals is to be in addition to the regular Day and Night Signals of the Line, which must be first exhibited.

3. Whenever an accident occurs to a Train, by which the Line is obstructed, the Guard is to go back 600 yards, to stop any Engine or Train following on the same Line, and as he proceeds he is to place on the Rail, at the distance of every 200 yards, one of these Signals; and on his arriving at the end of the above-mentioned distance, he is to place Two Signals upon the Line of Rail.

4. Should the accident occasion the stoppage of both Lines of Rail, the Guard is to send the under Guard or Fireman in advance of the Train, to place the Signals on the opposite Line of Rail to that which the Train is on, in the same order as to distance as is above directed for the Guard, by which precaution both Lines of Rail will be protected.

5. In case of the stoppage of either Line of Rail from any cause, or there being any danger apprehended in the passage of an Engine or Train, whether in Foggy Weather or otherwise, the Station Police, Signal, Switch, or Tunnel man, is to place one of these Signals on the Line or Lines of Rail so obstructed, every 200 yards from the point of danger, until the Line or Lines of Rail are so protected for half a mile.

6. In Foggy Weather these Signals are to be similarly used whenever an Engine or Train is following, or likely to follow, too closely upon another Engine or Train, or in cases of emergency or great danger.

7. Whenever an Engine passes over one of these Signals, the Engine-Driver is immediately to stop the Train, and the Guards are to protect their Train by sending back and placing a Signal on the Line every 200 yards, to the distance of 600 yards; the Train may then proceed slowly to the place of obstruction.

8. After the obstruction of the Line is removed, the Guards, Police, or Engine-Driver, must remove all the Signals from the Rails before proceeding.

9. Each Guard, Policeman, and Pointsman, not at a Station, and all Enginemen, Gatemen, Foremen of Works, Gangers of Plate-Layers, and Tunnelmen, will be provided with packets of Signals, which they are always to have ready for use whilst on duty; and every Officer in charge of a Station will be provided with these Signals, which are to be kept in an unlocked drawer or shelf in the counter, in order that they may at all times be easy of access to all on duty at the Station: and every person connected with the Station shall be made acquainted with the place where they are deposited.

10. All the persons above named will be held responsible for their having the proper supply of Fog Signals; when one or more are expended, it is their duty immediately to apply to the Superintendent of their section for a further supply to keep up the stock as above directed.

SECTION IV.

REGULATIONS FOR ENGINEMEN.

1. No Engine shall pass along the wrong line of Road, but if, in case of accident, an Engine shall be unavoidably obliged to pass back on the wrong line, the Engineman is to send his Assistant, or some other competent person, back a distance of not less than **800** yards, before his Engine moves, to warn any Engine coming in the opposite direction, and the Assistant shall continue running, so as to preserve the distance of not less than **800** yards between him and the Engine. If dark, the man shall take

his light and make a signal by waving the same **UP** and **DOWN**, and the Engineman of the Engine moving on the wrong line shall keep his Steam Whistle constantly going, and must not move in the wrong direction farther than to the nearest shunt, where he is instantly to remove his Engine off the wrong line of Road; and it is expressly forbidden that any Engine should move on the wrong line of Rails at a greater speed than **four miles an hour.**

2. All Engines travelling on the same line shall keep **800** yards at least apart from each other, that is to say,—the Engine which follows shall not approach within **800** yards of the Engine which goes before, unless expressly required.

3. No person, except the proper Engineman and Fireman shall be allowed to ride on the Engine or Tender, without the **special** permission of the Directors, or one of the Chief Officers of the Company.

4. The Engineman and Fireman must appear on duty as clean as circumstances will allow, and every Driver must be with his Engine 30 minutes, and every Fireman 45 minutes, before the time appointed for starting, in order to see that the Engine is in proper order to go out, has the necessary supply of coke and water, and that the Signals are in a fit state for use.

5. The Front Buffer Light of a Passenger Train is **White,** and of a Goods or Cattle Train **Green,** except on the Liverpool and Manchester Section.

6. Every Engineman shall have with him at all times in his Tender the following Tools:—

1 complete set of Lamps
1 complete set of Screw Keys
1 large and small Monkey Wrench
3 Cold Chisels
1 Hammer
1 Crow Bar
2 short Chains with Hooks
1 Screw Jack
A quantity of Flax and Twine
4 large and small Oil Cans
Plugs for Tubes
2 Fire Buckets
Fog Signals and Red Flag

7. When the Engine is in motion, the Engineman is to stand where he can keep a good look-out a-head, and the Fireman must at all times be ready to obey the instructions of the Engineman, and assist him in keeping a look-out, when not otherwise engaged.

8. No Engine is permitted to stand on the **main line** (except under very special circumstances) when not attached to a Train, and the Engineman shall not at any time leave his Engine or Train, or any part thereof, on the main line, unless there be a competent man in charge to make the necessary signals.

9. No Engine shall cross the Line of Railway at a Station without permission.

10. An Engineman is never to leave an Engine in Steam, without shutting the Regulator, putting the Engine out of gear, and fixing down the Tender Break.

11. No Engine is allowed to **propel** a Train of Carriages or Waggons, but must in all cases draw it, except when assisting up inclined planes, or when required to start a train from a Station, or in case of an Engine being disabled on the road, when the succeeding Engine may propel the train **slowly** (approaching it with great caution) as far as the next shunt or turn-out, at which place the propelling Engine shall take the lead.

12. No Engine is to run on the Main Line **Tender foremost,** unless by orders from the Locomotive Superintendent, or from unavoidable necessity.

13. Every Engineman on going out is to take his **Time Table** with him, and regulate by it the speed of his Engine, whether attached to a Train or not; and when not attached to a Train, he is on no account to stop at second-class Stations unless specially ordered, or there is a signal for him to do so.

14. Enginemen are not allowed (except in case of accident or sudden illness) to change their Engines on the Journey, nor to leave their respective Stations, without the permission of their Superintendent.

15. When the Road is obscured by steam or smoke (owing to a burst tube, or any other cause), no approaching Engine is allowed to **pass through the steam,** until the Engineman shall have ascertained that the road is clear; and if any Engineman perceive a Train stopping, from accident or other cause, on the road, he is immediately to **slacken his speed,** so that he may pass such Train slowly, and stop altogether if necessary, in order to ascertain the cause of the stoppage, and report it at the next Station.

16. Where there is an accident on the opposite Line to that on which he is moving, he is to stop all the Trains between the spot and the next Station, and **caution** the respective Enginemen, and further he is to render every assistance in his power in all cases of difficulty.

17. In case of accident to his Engine or Tender (when alone) he is to send back notice by his Fireman to the nearest Policeman on duty: but if the Policeman is too distant, the Fireman is to remain stationary not less than **600** yards in rear of his Train (until recalled), showing his Red Signal until he has rejoined his Engine. (See Rule 17, page 182.)

18. Enginemen are strictly prohibited from throwing out of their Tender any small **coke** or dust, except into the pits made for that purpose at first-class Stations.

19. Enginemen with Pilot or Assistant Engines must be prepared (while on duty) to start immediately on receiving instructions from the Locomotive Foreman or the Station Master.

20. Enginemen are strictly enjoined to **start and stop their Trains slowly,** and without a jerk, which is liable to snap the couplings and chains; and they are further warned to be careful not to shut off their steam too suddenly (except in case of danger), so as to cause a concussion of the carriages.—This rule applies more especially to **Cattle Trains,** the beasts being liable to be thrown down and injured by a sudden check.

21. No Engineman is to start his Train until the proper Signal is given: he is invariably to start with care, and to observe that he has the whole of his Train before he gets beyond the limits of the Station.

22. It is very important that Engine-Drivers use the utmost caution when shunting Waggons into sidings, so as to avoid injuring the Waggons or other property of the Company.

23. Enginemen in bringing up their Trains are to pay particular attention to the state of the **weather** and the condition of the **Rails,** as well as to the length of the Train: and these circumstances must have due weight in determining when to shut off the Steam. Stations must not be entered so rapidly as to require

a violent application of the Breaks, and any Engineman over-running the Station will be reported.

24. Enginemen and others are required to be careful in turning their Engines on the Tables, so as not to **swing** them round rapidly.

25. Engines running alone, or taking luggage or empty carriages, must not exceed a speed of **20** miles an hour without distinct orders in each case, or some urgent necessity.

26. Enginemen and Firemen are to pay immediate attention to all **Signals,** whether the cause of the Signal is known to them or not; and any Engineman neglecting to obey a Signal is liable to immediate dismissal from the Company's service. The Engineman must not, however, **trust to Signals**' but on all occasions be vigilant and cautious, and on no account be running before the time specified in his Time-Table. He is also to obey the Special orders of the Officers in charge of Stations, when required for the Company's service.

27. Whenever he sees the **Red Signal,** or any other which he understands to be a Signal to stop, he is to bring his Engine to a stand close to the Signal, and on no account to pass it.

28. In addition to the usual Red Signals, the Police have orders to place **Detonators** on the Rails in foggy weather, and every Engineman, when he hears a Detonating Signal, is to bring his Engine to a stand as quickly as possible. The Enginemen also are supplied with these Signals to be used in the same manner. (See *Rule for Fog Signals.*)

29. **Ballast** Engines are prohibited from passing along the Main Line in a **fog,** except when authorised to do so under special circumstances.

30. As a further precaution in foggy weather, no Engineman is allowed to leave a Station with a Train until the preceding Train has been started at least **ten minutes**; and before starting, the Clerk in charge of the Station, or the Policeman on duty, is to give the Engineman **the exact time** when the preceding Train started, and where it is next to stop.

31. Enginemen are at all times to use great caution in **foggy**

weather, and especially in approaching Stations, from the difficulty of discerning the regular Signals until close upon them; and they are to be prepared to bring their Engines to a stand, should it be required.

32. No Engineman is to pass from a Branch on to the Main Line until the Policeman at the Junction Points signals the Main Line clear, and in foggy weather he is to bring his Engine to a stand before reaching the **Junction Points,** and not to enter upon the Main Line till he has ascertained from the Policeman how long the preceding Train or Engine has passed.

33. To avoid risk of collision on single Lines, from the meeting of another Engine, no extra Engine, with or without a Train, is allowed to pass along the Line without **previous notice.**

34. Every Engineman is to be careful, when he passes a Station, or when the way is under repair, to proceed slowly and cautiously; and he is also to do so whenever he sees the **Green Signal.**

35. Luggage, Coal, and Ballast Trains are always to give way to Passenger Trains by going into the nearest siding.

36. The Whistle is to be sounded on approaching each Station and level crossing, and on entering the Tunnels. **Three** short sharp whistles, rapidly repeated, must be given when danger is apprehended, and when it is necessary to call the attention of the Guards to put on the Breaks. When more than one Engine is attached to the Train, the Signal is to be given by the Leading Engineman; and in case of danger is to be repeated by the following Enginemen, who will forthwith reverse their Engines and attach their Tender Breaks. Frequent use must be made of the Whistle in foggy weather.

37. Enginemen with Luggage Trains are to approach all stopping places at a speed not exceeding **ten miles** an hour, when within a quarter of a mile of the stopping place, and to signal the Breaksman by **two** distinct Whistles to put on his Break before the Tender Break is put on.

38. Luggage Enginemen must refuse to take up waggons of goods, if they are of a nature to take fire by a spark or hot cinder,

unless such goods are **completely sheeted.** Enginemen are to see that the cinder-plates at the back of their Tenders are in good order.

39. Should **fire** be discovered in the Train, the Steam must be instantly shut off, and the Breaks applied, and the Train be brought to a stand, the Signal of obstruction to the Line be made, and the burning waggon or waggons be detached with as little delay as possible. No attempt must ever be made to run on to the nearest water column, if it is more than **300 yards** from the place where the fire is discovered, as such a course is likely to increase the damage.

40. The movements of all Trains are under the orders of the Guard, to whose instructions as to stopping, starting, &c., the Engineman is to pay implicit attention.

41. If any part of a Train is detached when in motion, care must be taken not to stop the Train in front before the detached part has stopped, and it is the duty of the Guard of such detached part to apply his Break in time to prevent a collision with the carriages in front, in the event of their stopping.

42. Whenever a Red Board or Red Flag is carried on the last carriage or waggon of a passing Train, it is to indicate that **a Special** or **Extra Train** is to follow; and when such Extra Train is to run at night, an additional Red Light must be attached to the tail of the preceding Train.

43. Every Engineman at the end of his journey is to report to the Superintendent of Locomotive Power, or his Foreman, or to the Clerk in attendance—

First—As to the state of his Engine and Tender.

Second—As to any defect in the Road or Works, Electric Telegraph posts or wires, or any unusual circumstance that may have taken place on the journey.

44. He is also to see that his Signal and Gauge Lamps are taken into the Porter's Lodge, for the purpose of being trimmed.

SPECIAL REGULATIONS.

LONDON AND BIRMINGHAM SECTION.

45. Enginemen with Express Trains are to slacken speed round the curves at Weedon, Leighton, and Berkhampstead.

46. Whenever an Engineman approaches **Camden** Station in a fog, or whenever the Policeman at the South entrance of the Primrose Tunnel shows the Green Signal, he is to bring his Engine to a stand at **Chalk Farm Bridge**, unless on his arrival there the Policeman signals him to proceed.

47. The same regulation is to be observed on his approaching **Birmingham** in foggy weather; and when the Green Signal is shown by the Policeman near the **new Canal Bridge**, he is to stop at the Ticket Platform, unless there signalled to proceed.

48. Whenever the Pilot Engineman, assisting a Train from Euston, intends to run into the siding at the summit of the incline, he is to detach his Engine before arriving at the Ticket Platform, and, on approaching the Policeman at the facing points, motion to the left with his hand (by night with his hand-lamp): in the absence of this signal the Policeman is not to alter the points, but to allow the Engines and Train to pass on the Main Line.

GRAND JUNCTION SECTION.

49. All Trains passing from or to the Liverpool, Manchester, and the Grand Junction Railways at Newton, are to slacken speed so that the same shall not exceed **Five** miles an hour before passing from one line to the other.

50. Engines passing from the Chester Line to the Main Line at Crewe are to come to a stand before entering the Main Line.

Inclined Planes.

51. The Assistant Engine is invariably to return down the Main Line, and no Luggage Engine is to leave any part of

its Train on the Main Line unless in case of urgent necessity. No Luggage Engine is to attempt to ascend the **Sutton** and **Whiston** Inclines with a greater load than their Engines, assisted by the Bank Engines, can manage: and if any doubt exist whether the Engines are or are not able to take up the whole load at one trip, the Train must be stopped at the bottom, and the requisite number of Waggons be shunted, and left in a **siding** and **not** on the Main Line.

52. In the event of any Waggons being left upon or at the foot of the Incline, and a succeeding Engine coming up, such Engine is not to commence propelling or drawing the said Waggons until the Engines which left them shall have returned.

53. No Engine, either with Passengers, Coals, or Merchandize, is to go down the Inclined Plane at a greater speed than 30 miles an hour, and no Engineman is to attempt to make up lost time in going down any Inclined Plane; and coming down **Whiston Incline,** no Engineman shall begin to increase his speed till he reaches **Huyton Quarry** Station.

54. In going down the Inclined Planes, Enginemen, Guards, and Breaksmen must take care that they have complete control over the speed of the Trains by applying their Breaks.

55. Enginemen with Trains requiring assistance up the **Whiston** and **Sutton** Inclined Planes are required in all cases to go up the bank first and let the Assistant Engine follow.

56. All Enginemen are required to give one loud whistle as they pass **Platt's Bridge.**

MANCHESTER AND BIRMINGHAM SECTION.

57. An interval of not less than **Five Minutes** must elapse between any two Trains travelling in either direction on the same line of Rails between **Store Street Station** and the **Sheffield Junction;** and on this part of the Line, all Engines, with or without Trains, must proceed at such a reduced speed as will enable the Engineman to stop almost instantaneously, if required so to do.

58. Every Train from the Manchester and Sheffield Line must

stop before arriving at the **Junction**, and wait until the Policeman in charge of the Junction Points indicates that the Line is clear. Should the Manchester and Birmingham Down Train have exceeded the proper time of passing the Sheffield Junction, and the Manchester and Sheffield Train have arrived at its proper time, or before the other is in sight, the Sheffield Train will proceed **First** to the Station.

59. Enginemen on approaching the Sheffield Junction, from whatever direction, with or without a Train, are invariably to blow the Steam Whistle as soon as they arrive within a quarter of a mile of the Junction, and they must not pass that place at a greater speed than **Five** miles an hour.

TRENT VALLEY SECTION.

60. Enginemen proceeding to the Trent Valley Line are to open their Whistles once when they arrive within a quarter of a mile of the Junctions at Stafford and Rugby, motion with their hand, or hand-lamp, as a signal to the man at the Junction Points, and must invariably slacken speed to **Five** miles an hour. Engines to or from Birmingham are to give **two clear whistles**, with an interval between them, on approaching the Junctions. The slackening of speed is especially enjoined on the Enginemen from Birmingham in case of a Train to or from the Trent Valley being in the act of crossing.

BOLTON BRANCH.

61. Enginemen having charge of Coal or Ballast Trains travelling so as to meet a Passenger Train, are not to pass any Siding or Station at a less interval than **fifteen minutes** before the time at which the next Passenger Train is due, and every Engineman must make himself well acquainted with the time of the Passenger Trains.

62. Enginemen are required to slacken speed previous to crossing the Turnpike Roads at Daubhill, Chequerbent, and Crook Street.

63. All Enginemen are directed not to pass through the

Points at the Double Road on Dean Moor at a greater speed than **eight** miles an hour, nor over the **curve** between Leigh and Bradshaw Leach Stations at a greater speed than **twelve** miles an hour.

SECTION V.

REGULATIONS FOR GUARDS.

1. Each ordinary Train on the Main Line is to have at least **two** guards, and the short Trains on the Branch Lines **one** Guard. If the Train is very heavy, additional Guards will be sent with it, at the discretion of the Superintendent.

2. Every Guard is to be at the Station from which he is to start **half an hour** before the appointed time, that he may see to the marshalling of the Carriages, and the arrangement of the Passengers' Luggage, Parcels, &c.

He is to see that he has on the Train,

1 Pair of Signal Flags and Case.
1 Hand Signal Lamp and Box.
2 Canisters of Fog Signals and Blue Lights.
12 Links and Box.
1 Pair of Levers.
1 Box for Despatches.

3. Until the Train starts the Guards will be under the order of the Station Master.

4. Every Guard is to see that his **Signal Lamps** are in a fit state for use and properly trimmed; the Senior Guard will ascertain that the Tail and Side Lights are securely fixed before the Train starts, and is responsible for their being lighted at sunset as well as during a Fog.

5. The Train, when in motion, will be under the order and control of the Senior Guard; the Passengers and their Luggage must be considered in his charge, and he will be responsible for the safety and regularity of the whole. He is to keep the time of running, and will be answerable that any Carriage which is to be left at an intermediate Station is detached.

6. With through Trains (viâ the Trent Valley) in which the whole journey is performed without change of Guard, there will be **three** Guards between London and Rugby, and the following will be the arrangements:—

The Senior Guard will run between **London and Liverpool,** and have charge of the whole service connected with that portion of the Train including the Traffic to the North through Parkside and that to Chester; delivering the former at Warrington and the latter at Crewe, to the Branch Guards there. The same on the return journey.

The Second Guard will run between **London and Manchester,** and will have charge of the whole service connected therewith, and also the road-side business in Parcels, Luggage, &c., between Rugby and Crewe. He will also keep the time between Crewe and Manchester, and make out his Way Bill for that Line.

The Third Guard will run between **London and Birmingham,** and have charge of the whole service connected therewith, and also the road-side business in parcels, Luggage, &c., between London and Rugby. He will also keep the time between Rugby and Birmingham, and make out his Way Bill for that portion of the journey.

7. When there are **two Guards** with a Train, the under Guard will ride in the Van next to the Tender. He will stand with his back to it, and keep his attention fixed on the Train, looking alternately **down** either side, and noting any irregularity in the running—any particular oscillation of a Carriage, or any signal which may be made by a Passenger.

He will be provided with the means of immediately communicating with the Engineman in the event of any circumstance arising which may render it prudent or necessary to stop the Train.

The place of the Senior Guard will be on the last Passenger Carriage, which must always be a **Van** or a **Break Carriage,** and his duty will be to look **forward** and communicate with the Second Guard on the leading Carriage.

With through Trains when there are **three** Guards with a Train, their position will necessarily be regulated by the division

of the Line to which their section of the Train is proceeding, but the duties of the Guard on the **leading** and **last** Carriage will always be as stated above, the **middle** man communicating between them.

8. On arrival of a Train at a Terminus the Guards are not to leave the Platform until they have delivered over all **Parcels** as well as **Luggage** to the Porters appointed to take charge of them, and if any article is missing they are immediately to report the same to the officer in charge of the Station.

9. Before leaving the Station the Guards are to make out a return according to a printed form, noting at the foot every circumstance of an **unusual** character that may have happened; they are also to state on this return whether all the Parcels and Luggage by the Train have been duly delivered.

10. The number of any Carriage complained of as **uneasy**, and the Division to which it belongs, must be entered on the Way Bill.

11. Should any Train **overshoot** the Water Pillar at a stopping place by the length of the Train, the circumstance must be noted on the Bill.

12. No Passenger is to be allowed to **ride outside**, without special permission.

13. Guards must keep a good look-out that no Passenger on arriving at any Station gets out for the purpose of **re-booking** by the same Train, as this is forbidden by the Regulations.

14. Guards are forbidden to pass over the **tops of the Carriages** when in motion, and any Guard doing this without urgent necessity will be fined.

15. The Doors of the Carriages on the off side are always to be **locked**, and Guards are charged to request Passengers to keep their seats in case of any stoppages on the road, except when necessary to alight.

16. **Smoking** in the Carriages and at Stations is forbidden by the Regulations. The Guard must prevent Passengers endangering themselves by imprudent exposure. In the event of any

Passenger being **drunk and disorderly,** to the annoyance of others, the Guard is to use all gentle means to stop the nuisance; failing which, he must, for the safety and convenience of all, exercise his authority, and confine him in a separate place until he arrives at the next Station.

17. When a Passenger or Luggage Train **comes to a stand on the Main Line,** or is only enabled to proceed at a very slow pace, the Senior Guard is to send back notice by the Junior Guard to the nearest Policeman, if within distance for prompt communication; but if too far, then the Junior Guard will remain stationary, not less than **600** yards in rear of the Train, showing his Red Signal until recalled. Should the 600 yards terminate near a curve in the Line, he is to continue on until his Red Signal can be well seen round the curve; and before starting to rejoin his Train, he is to leave one of the 10-minute Blue Light Signals by the side of the Rail. Should the Train have only one Guard, he will perform this duty.

18. Every Guard is to observe the strictest attention and obedience to all the **Signals** and **auxiliary Signals** at Crossings, intermediate Stations, Tunnels, and of each Policeman on the Line, as well as to respect all special orders which the officer in charge of Stations may think necessary.

19. In the event of accident, blocking one Line and requiring the Train to pass along the wrong Line, the utmost caution must be exercised; and no Train is to be permitted to proceed on the wrong Line without a **Memorandum in Writing** from a person in authority at the spot where the accident has happened. So liable are verbal messages to be misunderstood, that, should a verbal message be received to send forward a Train on the wrong Line, the messenger must be sent back for a written order before the Train is allowed to move.

20. Whenever a regular Train is to be followed by a special one, a **Red** Board or Flag is to be affixed on the rear of the last carriage of the regular Train by Day, and an additional Tail Light by Night. The Senior Guard of a Passenger Train, and the Guard of a Luggage Train, must ascertain for what purpose this Signal is affixed. He is to see that it is removed at the

proper Station, and will report the circumstance under which the Special Train is about to follow.

21. When from accident to the Train, or from any other cause, it is necessary to **secure the attention** of the Engineman, the Guard is to apply his Break sharply, and as suddenly release it. This operation repeated several times is almost certain, from the check it occasions, to attract the notice of the Driver, to whom the Red Flag or Lamp must be immediately waved as a signal to stop.

22. The Guard must not allow any Passenger or parcel to be conveyed by the Train unless **properly booked**; and if he has reason to suppose that any Passenger is without a Ticket, or is not in the proper Carriage, he must request the Passenger to show the Ticket. When a Passenger is desirous of changing his place from an **inferior** to a **superior** carriage, the Guard must have this done by the Clerk at the first Station.

23. Great importance is attached to the most **prompt delivery** of Letters, Invoices, and Despatches consigned to the care of a Guard; and any neglect in this particular will be severely dealt with.

24. Prisoners who are in charge of the Police, and persons afflicted with insanity, must never be mixed along with the other Passengers, but be placed in a **compartment**, and, if practicable, in a **carriage, by themselves.**

25. Servants and others connected with the Railway (Directors excepted) are required to book and pay their fare the same as other Passengers, except the following Officers, who travel free, who have the power to grant Passes to individuals proceeding on the **Company's business only**:—

The GENERAL MANAGER—The SECRETARIES.

BRUYERES . . .	*Superintendent Southern Division.*
NORRIS . . .	,, *Northern Division.*
WOODHOUSE . .	,, *Man. and Bir. Section.*
DOCKRAY . . .	*Resident Engineer, Southern Division.*

Mr. PALMER . . .	*Assistant Manager,*	*Liverpool.*
Mr. BROOKS . . .	,,	*London.*
Mr. ROBINSON . . .	,,	*Birmingham.*
Mr. JONES	,,	*for the Chester and Crewe Branch.*
Mr. BRADSHAW . . .	,,	,, *Bolton Branch.*

For the Locomotive Department.

Mr. MCCONNELL . .	*Southern Division.*
Mr. TREVITHICK . .	*Northern Division.*
Mr. RAMSBOTTOM . .	*Man. and Bir. Section.*

For the Merchandise Department.

Mr. EDGRALL . . .	*Central Division.*
Mr. POOLE	*Northern Division.*
Mr. MILLS	*Southern Division.*
Mr. SALT	*Man. and Bir. Section.*

For the Carriage Department.

Mr. WRIGHT . . .	*Southern Division.*
Mr. WORDSELL . . .	*Northern Division.*

Mr. MORISON . . . *For purposes of the Clearing House.*

These Passes must always be issued on the authorised printed Forms, and the reason of the Pass being granted must be entered on the Counterfoil.

SECTION VI.

REGULATIONS FOR BREAKSMEN OF LUGGAGE TRAINS.

1. The Breaksman or Breaksmen, as the case may be, must be in attendance **60** minutes before the hour fixed in the Time Bill for the departure of the Trains.

2. They are carefully to examine the loading and sheeting of the waggons before starting from each Station, to insure the protection of the goods from **rain** and **sparks.** They must also, at every Station where the Train stops, ascertain that the loading of the Trucks has not moved, and specially that it does not **overhang** the sides.

3. They are to be careful to ascertain that the axles of the waggons are properly **greased** before starting from a Station.

4. The Head Breaksman, where there are two, is responsible for seeing that the **Signal Lamps** are attached to the Train, and that on arrival they are delivered to the Lamp-man. He is also responsible to have these Lamps lighted at Sunset and during a Fog.

5. The Breaksman is to enter on his Way Bill any **delays** or **casualties**, and report the same on arrival to the proper officer. When any waggons are left on the road that should have been taken forward, the Breaksman must instantly on arrival give notice of the same.

6. The Breaksman is to receive and enter on his Way Bill such despatch-bags, parcels, invoices, and letters, as may be delivered to him, and must be very particular to deliver correctly any parcels of Goods which may be intrusted to him between roadside Stations, and to forward to their address without delay all **letters, despatches,** and **invoices** consigned to his care.

7. He is to examine the **labels** on the waggons, and compare with the greatest exactness the destination and number upon each waggon with those in the Way Bill. He is to notice any discrepancies in the latter, and correct any errors before starting.

8. The Breaksman is to be provided with a few spare centre chains, a crowbar, fire-bucket and rope, a case of fog signals, and hand signal lamp; also a small Red Flag and a White one—the Red Flag being a Signal to stop, and the White one to proceed.

9. Whenever a Train is stopped at any intermediate Station, or on the Line, it is the special duty of the Breaksman to see that the **contents** of the waggons are not interfered with, and that the proper **Signals** are given when the Line is obstructed. In case of a break-down or other stoppage on the main Line, he is to go back **600** yards, or until he meet a Policeman, making the proper signal with a Red Flag by day, or Red Lamp by night, or in foggy weather by placing a **Fog Signal** on the Rail to stop any approaching Train, leaving the waggons in the charge of the Engineman; if in going the above-named distance

he does not meet a Policeman, he must not leave the place until relieved. (See Rule 17, p. 182.)

10. No person is allowed to **walk** or **climb** over the tops of the waggon sheets.

11. The Breaksman is to make himself acquainted with the Time of the Passenger Trains passing all parts of the Line, and when likely to be overtaken remind the Engineman immediately to **shunt** into a siding out of the way of the approaching Train, and in passing warn the Police signal-men of their intention.

12. The Breaksmen are positively prohibited from allowing any one to **ride in the Breaksman's box,** or on the Train, without written authority; and any disobedience to this order will be punished.

Section VII.

REGULATIONS FOR STATION MASTERS AND CLERKS.

1. Every Officer in charge of a Station is to be answerable for the Office and Buildings, and the Company's Property there. He is also to be responsible for the faithful and efficient discharge of the duties devolving upon all the Company's Servants at the Station.

2. He is to see that all general and other orders are duly entered and executed, and that all books and returns are regularly written up, and neatly kept.

3. He is to take care that all the Servants at his Station behave respectfully and civilly to Passengers of every class, and that no gratuities from the public are received by them under any circumstances.

4. He is to inspect daily all rooms and places in connection with the Station, in order to see that they are neat and clean.

5. He is to take care that all the Servants at his Station come

on duty clean in their persons and clothes, shaved, and with their shoes brushed.

6. He is also to cause the Station to be kept clear of weeds, and have the ballast raked and preserved in neat order. He must be careful that all stores supplied for the Station are prudently and economically used, and that there is no waste of gas, oil, coal, or stationery.

7. He is to report, without delay, neglect of duty on the part of any one under his charge; and in case of complaint against any man, he is to communicate the particulars as soon as possible, so that the offender may be sent to head-quarters, if the case require it.

8. No Station Master is allowed to be absent without leave from the Superintendent of his Division, except from illness, in which case he must immediately inform the Superintendent, and take care that some competent person is intrusted with the duties.

9. Carriages and Waggons are never to be allowed to stand on the main Line, but must be placed in a siding, and at night the wheels must be securely scotched.

10. No Engine, Carriage, or Waggon, must be allowed to shunt or cross the main Line if a Train is expected, unless the proper signal shall have been previously sent back.

11. On the arrival of a Train at a Station, the Red Signal is to be shown, and continued for five minutes after the departure of the Train. In foggy weather the Auxiliary Signals must always be lighted, and used as shown by Rule 13, p. 165.

12. Every exertion must be made for the expeditious despatch of the Station duties, and for insuring punctuality in the Trains.

13. No Train is to be started before the time stated in the Tables.

14. As a general rule, Passenger Trains are to take precedence of Luggage Trains; and Goods Trains must not be started from any Station when Passenger Trains are due. This Regulation, however, will be subject to modification, agreeably to the circumstances of the Trains, the state of the weather, the weight of

the load, and the character of the Engine:—Thus, a light through Goods or Cattle Train, on a clear day or night, with a good Engine, may be started before a Passenger Train which is due, should the latter have to stop at all the Stations. Again, if, from facts which may come to the knowledge of the Station Agent, by means of the Electric Telegraph or otherwise, the Passenger Train which is due may not be expected for some time, the Agent will be justified in despatching the Goods Train, taking care in this case specially to warn the Engineman of the Passenger Train, when it arrives, informing him the precise time when the Luggage Train was despatched and where ordered to shunt.

15. On a Line like the London and North-Western, where the Traffic in Goods and Passengers is so intermingled, much must be left to the discretion of the Station Agents, but the discretionary power must be exercised with great prudence and caution. Every endeavour, consistent with safety, must be made to expedite the departure of the Goods Trains from the Road-side Stations; and no delay should be permitted unless obstruction to Passenger Trains may be reasonably apprehended.

16. In deciding in difficult cases whether to despatch a Luggage Train or not, the opinions of the Engineman and Breaksman, who must be best acquainted with the state of the Engine and Load, should be obtained, and great weight should be attached to these recommendations, but the decision on the course to be pursued will still rest with the Station Agent.

17. A Return of the Delays at each Station is in future to be submitted to the Manager, which will enable the Directors to appreciate the activity of the Station Agents.

18. The above regulations will be facilitated in their operations by the limit to which the Directors have restricted the weight of the Trains. As a general rule, no Train will be allowed to exceed forty Loaded Waggons; and whenever this number shall be exceeded, special notice will be given. When the number of Waggons to be despatched exceeds forty, thereby requiring another Engine, the load will be divided, and despatched in *Two Trains*, at an interval of *Ten Minutes*.

19. Waggons of Merchandise are always to have precedence over Coke, except written instructions are produced to the contrary, or the Agent is satisfied, by verbal explanations, that the case is urgent, and that deviation from the rule would be expedient. When this occurs it is to be noted in the Report.

20. In order to guide the Agents in deciding on the policy of attaching Waggons to passing Trains, the Locomotive Department will in future supply the Drivers with a Certificate of each Luggage-Engine's capability; stating the average number of Loaded Waggons which may be attached to it, in good and bad weather respectively; and this Certificate will be considered to remain in force until withdrawn by the Superintendent of the Locomotive Department.

21. Empty Waggons will be worked down by spare or returned Engines, as the case may be. Three empty Waggons will be considered equal to Two loaded ones.

22. The through Trains between Liverpool, Manchester, the Midland Line, and London, which do not take up Roadside Goods, are to be pushed forward as rapidly as is consistent with safety.

23. When a Special Train has to be despatched from a Station, a Red Board or Red Flag by day and an additional Tail Lamp by night must be attached to the preceding Train.

24. An account of all unclaimed Luggage found at the Station is to be sent to the Clearing-house on a form furnished for that purpose.

25. The Clerks at the several Stations are to deliver Tickets to all persons booking their places for conveyance by the Railway, and no person is to be allowed to pass on the platform without producing his Ticket.

26. If the Guard or Station Clerk have reason to suspect that any Passenger is or has been travelling upon the Railway without having paid any Fare or the proper Fare, he may require such person to produce his Ticket; and every Passenger before leaving the Company's premises at the end of his journey is to be required to deliver up his Ticket. If any Passenger shall refuse or be unable to produce a proper Ticket, or shall commit any

other offence against the Bye-laws, Rules, and Regulations of the Company relating to Travellers by the Railway, the case shall be immediately investigated by the Chief Clerk of the Station where the occurrence may take place, who is to exercise his discretion as to the proceedings to be taken, always reporting what has been done.

27. The power of detention is to be exercised with great caution, and never where the address of the party is known, or adequate security offered for his appearance to answer the charge. When it shall be necessary to detain any party, such detention shall not continue for a longer period than is absolutely necessary, but he shall be conveyed before a Magistrate with as little delay as possible.

28. Passengers not producing their Tickets are to be required to deposit the amount of the whole Fare from the place whence the Train started until the inquiry can be made, in order to ascertain whether the Fare has been actually paid or not, and in every case the circumstances must be inquired into without delay and reported.

29. The power of detention for offences is limited to the person of the Passenger and does not extend to his Luggage, but the Luggage may be detained for the Fare in case it is not intended to proceed against the Owner for a Penalty, such Luggage being subject to a lien for the amount of the Fare.

30. As it is the *intent* which constitutes the offence, it is very desirable that the power of detention should be exercised with caution and discretion, as cases may frequently occur of persons travelling beyond the distance for which they have paid their Fare unintentionally, or even against their wish and to their inconvenience; and the right of detention is applicable only in cases of what is termed Over Riding to parties who *knowingly* and *wilfully* proceed beyond the place to which they are booked, not only without previously paying the additional Fare for the additional distance, but also with *intent to avoid payment thereof.*

SECTION VIII.

REGULATIONS FOR INSPECTORS OF POLICE.

1. Every Inspector is to **walk** over his district, and to report to the Superintendent of his division any irregularity he may detect.

2. Every Inspector is to see that the Policemen, Pointsmen, and Gatesmen in his district are at their posts—**clean** in their persons, sober, and attentive to their duty; and to ascertain that they are **conversant** with their orders, and that the Points are in good working order, **cleaned**, and **oiled**.

3. He is to see that each Police Box has a **copy** of the standing orders relative to Police Signals and Duties, and a copy of any order specially relating to the men at that particular post.

4. Every Inspector is to have a **list** of the names and places of abode of every Policeman in his district, so that in case of need he can summon them.

SECTION IX.

REGULATIONS FOR POLICEMEN AND POINTSMEN.

1. Every Policeman on duty is to stand upon the Line **clear** of the rails, and to give the proper signal on the passing of an Engine.

2. Every Policeman will be supplied with a **whistle**, to aid in calling the attention of the next officer in communication with him to a signal; and no signal must be considered to be received until answered by the Policeman to whom it is passed.

3. On a Train stopping at a Station after sunset, the Policeman on duty is to see that the Tail and Side Lamps are lighted and in

order, and, if not, he is to report the same to the Guard of the Train, as well as to the Clerk on duty.

4. On a Goods or Coal Train stopping at a Station, the Policeman on duty is to ascertain from the Breaksman at which Station the Train is **next to stop**, that he may inform the Engineman and Guard of the following Train. This precaution is more especially enjoined during foggy weather.

5. On a Policeman having to stop a Train, he is to tell the Engineman the cause, and then let the Train proceed, unless he has orders to detain it, in which case he is to desire the Engineman to draw on until the whole Train is well **within** the Signal Post, to admit of a following Train stopping at the Signal, without risk of collision.

6. When a Train stopping at a Station extends beyond the Signal Post, the Policeman on duty is to go back in **rear** of the Train with his Hand Signal, to a distance sufficient to ensure its being well observed by the Engineman of any other Engine that may be following.

7. This precaution, though at all times necessary, is more particularly so with the Up Trains at Weedon, Roade, and Leighton.

8. The Policeman stationed at the New Canal Bridge, near Birmingham, when he cannot discern the Signal at the Junction of the Gloucester Railway, is to show the **Green Signal** to every Engine passing towards Birmingham, and the Engineman is then to bring his Engine to a stand at the Ticket Platform unless there signalled to proceed.

9. At the junction with the Midland at Rugby—the Bedford at Bletchley—the Aylesbury at Cheddington—the Peterborough at Blisworth—the Leamington at Coventry—the Manchester and the Chester at Crewe—the Macclesfield at Cheadle, where Stationary Signals are placed, the Policeman is to keep the Red Signal always turned on to the **Branch Line**, to prevent an Engine passing to the Main Line until he has ascertained that the Main Line is clear, when he is to turn the Signal off the Branch and on to the Main Line.

Note.—The Trent Valley is henceforth to be considered the

Main Line, and the Rugby and Birmingham, and Stafford and Birmingham, the Branches.

10. Every Engineman on a Branch Line must bring his Engine to a stand in foggy weather **before** he reaches the Junction-points, and not enter on the Main Line till he shall have ascertained how long the preceding Train has passed; the **Policeman** is to give all the information required.

11. Policemen are hereby apprised that, except in cases of emergency, none but Regular Trains are to be permitted to travel in a **FOG**; and on these occasions when a Train stops at a Station, the Auxiliary Signals must always be used, as shown by Rule 13, page 165.

12. Policemen must also take notice, that, to avoid risk of collision on Single Lines, no extra Engine, with or without a Train, will be allowed to pass along the Line without **previous notice.**

13. Every Policeman is supplied with **Detonating** Signals to place on the Rails in foggy weather, and he is on these occasions to use them in addition to the ordinary Red Signal. (*See Regulations for Use of Fog Signals.*)

14. Every Policeman is responsible for his Stationary as well as Hand Signal Lamp being well **trimmed,** and showing a clear and distinct light.

15. The Policemen generally are not to allow strangers to **trespass** on the Line without written authority, and they are to report any occurrence of this nature to their Inspector. They will also respect any orders which the officers in charge of Stations may think necessary.

16. On a Policeman stopping a Train at the entrance to one of the long Tunnels, from another Train having passed within **ten** minutes, he is not to detain the Train beyond **two** minutes, but simply to inform the Engineman and Guard of the character of the Train in advance, and the time that has elapsed since it passed.

17. Should a Train issue from one of the long Tunnels, at which Police are stationed, without the **Tail Lamp** on the last

carriage, the Policeman on duty is immediately to walk back through the Tunnel with his lamp to ascertain whether a carriage has not been left behind, and, should this be the case, he is then to go on to the other end to instruct the Policeman there stationed to put on his Red Signal to stop any Engine from entering the Tunnel.

18. The Policemen stationed at Tunnels and intermediate Stations are directed to be very particular in making the Signals according to the Regulations. (*See Signals.*)

19. In all cases where Telegraphic communication is laid through a Tunnel, the Policeman at the entrance thereof is to sound the **Bell** on a Train going into the Tunnel, and the Policeman at the other extremity is to respond to the Signal on the Train emerging from it.

20. The Policeman stationed at the South entrance of the Primrose Tunnel is to sound the **Alarum** as soon as an Up Train enters the Tunnel, that the Camden Station may be made aware of the approach of a Train, and, if a Goods or Cattle Train, he is to turn it into the siding. Should it be a Passenger Train, the Policeman at Chalk Farm Bridge is to pass the Signal to the Euston Station.

21. When the Policeman at the South entrance of the Primrose Tunnel cannot distinguish the Signal at Chalk Farm Bridge, he is to show the **Green** Signal to every Engine passing towards Camden Station, and the Engineman is then to bring his Engine to a stand at the same Bridge unless signalled to proceed.

22. The Policeman in charge of the facing Points at the summit of the Incline at Camden is not to move them to allow an Engine to run into the siding, unless the Engineman motions with his hand. (See Rule 48, page 176.)

23. The duties of Pointsmen in charge of Switches are very simple, easily understood and remembered, and are at the same time not heavy, but they require great **care, attention,** and **watchfulness,** for any neglect may cause very serious accidents; Policemen are, therefore, warned always to be on the alert, and cautious in the discharge of their duty as Pointsmen.

24. The Pointsman is to be careful in keeping his Switches **clear** and well **oiled**: and whenever a Train has passed over, he is to see that no particle of coal or dirt has dropped within the Points, so as to prevent them from closing, and also that they are replaced in the **proper position.** He is also to try his Points before the passing through of a Train, that he may be thoroughly satisfied there is no impediment to their true working.

25. Where, from the peculiarity of the Line, it is necessary to employ facing Points, these precautions become **doubly** important.

26. Whenever, from the passage of a Train, the Points, Crossings, or Guide-rail receive injury or strain, or the rails themselves are **split** or **chipped,** the circumstance must immediately be reported.

27. In order to assist in discriminating Luggage Trains at night from Passenger Trains, the former carry a **Green** light on the Buffer-plank; but it must be understood that this is intended merely as an auxiliary signal, and is not to be **relied on** for turning a Train into a siding, which is only to be done when the Policeman on duty shall have **satisfied himself** as to the character of the Train.

SECTION X.

REGULATIONS FOR GATEMEN AT LEVEL CROSSINGS.

1. Every Gateman will be provided with Day and Night Signals, which he must keep in proper order.

2. Gates must always be kept **closed** across a road, except when required to be opened to allow the Railway to be passed.

3. Before opening the Gates, the Gateman is to satisfy himself that a Train is not in sight; he will then exhibit his Red light, and always allow the Signal to remain until the Railway is **clear** and the Gates closed.

5. A Red Signal must always be stationed **800** yards back before a Rail is taken out, or any obstruction caused to the Main Line. (See Rule 17, page 182.)

6. A Green Signal must be stationed **400** yards back whenever the state of the Line requires that the Train should proceed with caution.

7. No rail, block, or chair, is to be removed in a **fog**, or during the night, except by express permission from the Resident Engineer; and in all cases, before taking out a Rail, the Foreman is to have at the spot a perfect Rail in readiness to replace it.

8. No Truck or Lorry is to be placed on the Line except for the conveyance of materials; and any Truck or Lorry so used is to be followed by a man carrying a Red Signal, at a distancce of **400** yards at least. No Lorry is, under any circumstances, to be moved on the wrong Line.

9. No Truck or Lorry is to be used in a **fog**; and the wheels of Lorries must be constantly **locked** when not in use.

10. No Lorry is, under any circumstances, to be attached to the **end of a Train.**

11. Should special circumstances require the use of a Lorry in the Tunnels, or otherwise than in broad daylight, it must be followed by a man with a Red Light, and notice must be given by the Foreman to the Policeman at the entrance to the Tunnel of the time he expects the Lorry will be required in the Tunnel, that the Policeman may keep on the **Red Signal** during the whole time, and caution any Engineman entering in the Tunnel.

12. Every Overlooker is to have a **list** of the name and abode of every Foreman of his district, that, in case of accident, he may be enabled to summon them immediately to assist in any way that may be deemed necessary; and should any obstruction take place, caused by snow, frost, slips, or other sudden emergency, he is instantly to collect the required strength to overcome the obstacle.

13. The Plate-layers are to desist from work when a Train is within **400** yards, and the Foreman must order his men to move

to the side of the road clear of both Lines, to secure the men from the risk of accident by Trains running in opposite directions. If working in a Tunnel, and Trains are approaching in both directions, the Plate-layers must lie down between the two lines of way, till the Trains have passed.

14. If a Passenger Train approach within **ten minutes** of a Coal or Ballast Train, the Plate-layers must give the Signal to proceed **slowly.**

15. In the event of any Engineman neglecting to comply with the Signal to stop, or to proceed cautiously, as the case may be, the Foreman of the Plate-layers is to **report** the circumstance, in order that proper notice may be taken of it.

16. Every Overlooker is responsible that all **loose timber, stones, rails, chairs,** or other materials, as well as the workmen's tools, are removed from the road, and the Line kept clear of interruption of any kind.

17. The whole Line is to be **inspected** every morning before the arrival of the first **Up** and **Down** Train, and care must be taken that the Rails are in gauge, and the Keys driven home.

18. On learning that an **accident** has occurred, a Plate-layer is to proceed with all possible despatch to the next gang, from which a Plate-layer will in like manner run to the next more distant Plate-layer, till information of the accident has by this means reached the Station.

19. Having communicated the information, the Plate-layers are immediately to return to give their assistance.

20. Every Foreman having been sworn in as a Special Constable is required to order off all persons **trespassing** within the fences on his district, and if such persons persist in remaining he is to take them to the nearest Station, and give them into the charge of the Company's Police.

21. The Foreman is also to report if any gates which the owners or occupiers of land are required to keep shut have been **left open,** that the parties may be charged with the penalties, and any instance of sheep or cattle being on the Lines or Slopes is also to be duly reported.

22. Every Plate-layer is to make himself **duly acquainted** with the code of Signals in use on the Railway, as detailed in **Sections 2 and 3.**

SECTION XII.

REGULATIONS FOR GUARDS AND TUNNEL BREAKSMEN AT LIME-STREET.

GOING DOWN THE TUNNEL.

1. The moment a Train arrives at Edge Hill, the Tunnel-breaksman, whose turn it is to go down the Tunnel, is to **examine** how many **Breaks** there are on the Train, and, before the Train is allowed to start, must be perfectly satisfied that the requisite number are in good working order, and must report to the Superintendent on duty that they are so.

2. The Tunnel-breaksman must see that the **Guard** of the Train is at his post before the Train starts.

3. No Train is, on any account, to go down the Tunnel without a **Tunnel-breaksman.**

4. Trains going down the Tunnel are never to be allowed to exceed in speed **ten miles** an hour.

5. In some instances Trains have been allowed to acquire a considerable velocity before the Breaks were applied, the Breaksman relying on the power of the Breaks to stop the Train. This practice is most strictly **forbidden;** at no period of the descent must the Trains be at a greater speed than **ten miles** an hour; the Breaks must be applied gradually, and the Breaksman must be sure at all times that he has perfect control over his speed.

6. The Guard of the Train and Tunnel-breaksman will be held **equally** responsible for the safety of the Train.

7. No Train is to go down without a Guard and one Breaksman; when the Train exceeds **ten** coaches, there must be an

extra Breaksman; if it exceed **fifteen** coaches, two extra Breaksmen.

8. No Train is to follow another Train down the Tunnel without an interval of **five** minutes.

9. No Train of any description is to be allowed to pass down the Tunnel without the **Signal** having been previously given.

10. Whenever, from a number of Trains going down the Tunnel, there is a deficiency of Breaksmen at Edge Hill, the Breaksman, on applying to the Superintendent of the Station at Lime Street, is to be sent up without waiting for a Train.

GOING UP THE TUNNEL.

11. The Tunnel-breaksman in going up is to take charge of the messenger. Before starting, he will take notice of the **position of the Breaks,** and in case of the rope or messenger giving way, he will be required immediately to get to the Break and put it on fast, so as to prevent the Train going down the Tunnel.

12. In a Train of **five** coaches, the Train-guard will be sufficient; but if the Train exceeds that number, there must be a Tunnel-breaksman, and for every additional **five** coaches there must be an extra Breaksman. No more than **fifteen** coaches must at any time be taken up the Tunnel at once; and any Train exceeding that number must be taken up at twice.

13. No **Waggons** are to be sent down the Tunnels without **special** permission.

14. The Station Master at Lime Street will be answerable for the **efficiency** of the Breaksman, and he, or the Assistants on duty at Lime Street, will see to the carrying out of the regulations.

15. The Station Master, or the Assistants on duty at Edge Hill, will also do the same at the Tunnel top; and before a Train is allowed to start, the Officer on duty will be required to see that the **Guard and Breaksman are properly placed.**

16. The Officer on duty is required to report forthwith to the Assistant Manager, Lime Street, any instance of a Train being

allowed to run into the Station **too quickly,** even although no damage may have ensued.

REGULATIONS FOR WAPPING TUNNEL, LIVERPOOL.

17. No person, unless in service of the Company, is allowed to enter the Tunnel without permission of the Manager or Engineer, who will give a **printed pass** to strangers, when required.

18. On arrival of each Down Train at Edge Hill, it is the duty of the Tunnel-breaksmen to examine particularly the **Coupling Chains,** the **Breaks,** and the Loading of the Waggons, **before** they are brought over the **bank head** of the Tunnel. After doing which, the senior one of them must **sign the Register-book,** for assurance that all is right, safe, and ready. The same Breaksman must then go down with the Train to the bottom of the Tunnel, taking care that they hold full and complete control over the speed of the Train.

19. Every train is to be brought to a complete stand upon the bank head, whilst the requisite number of good Breaks are **pinned down.** The Breaksmen are required not to allow the Train to attain a greater rate of speed than **four to five** miles an hour in any part of the Tunnel, or fifteen minutes in time of descending, in order that they may be able to get off the Waggons without danger to themselves, and put down or take up any of the Breaks, as necessary.

20. When a Down Train consists wholly of loaded Waggons, and there is not any Break Waggon at hand to be sent down in front, the Breaksmen are first to see that at least **one-third** of the Waggons are provided with good and efficient Breaks; otherwise they must not venture to proceed with them down the Tunnel, until the deficiency is supplied by attaching an adequate number of empty Waggons, with serviceable Breaks, from the stock in the Sidings: but the Break Waggon must, if possible, in all cases be used.

21. When a Train is composed of loaded and empty Waggons, two empty are to be considered equal to one loaded. Not more than **thirty-five loaded** Waggons may be taken down the Tunnel at any one time, and two Breaksmen must attend each Train. None but the regularly appointed Tunnel-breaksmen must ever attempt to convoy a Train.

22. Signal Lamps and Hand Lamps must be kept properly trimmed and burning. A Red Signal Lamp, lighted, must always be fixed on the rear of the last Waggon going down the Tunnel, and a Green Signal Lamp lighted and fixed upon the most conspicuous part of the front Waggon in the same Train. They must both be returned to Edge Hill by the first set up. No persons must ever leave any Waggon standing upon the Up Line within the Tunnel, nor upon the Down Line, without fixing a well-lighted Red Signal Lamp thereon, and remaining with it until removed to the bottom. The signal to **stop** must be made by waving the Hand Lamp **Up and Down.** The man on duty at the Wheel must look out for Waggons coming Down, and pass the word to the Breaksman whether or not the Line is clear; the exchange of such Signal to be made by waving the Hand Lamps **horizontally,** and then the Breaksman may **with caution** proceed. The Signal to "*come forward*" to be made by waving the Hand Lamps **round.**

23. Each set of Waggons drawn up the Tunnel to consist of more than **six,** until further orders. The man on duty at Wheel must examine the Endless Rope, the Messengers, the ling Chains, the Van Doors, and the Loads upon the gons, to see that all is right and safe to pass upwards, that Coupling Chains are properly hooked, that the last Waggon provided with a good and powerful Break, and then the same Breaksman must proceed with the set, and look out for Down Trains, to apprize the other men in charge thereof whereabouts any Waggons are before them, to report any impediments in he Tunnel to the Superintendent or Goods Manager.

24. When the Rails on the Bank Head, or within the Tunnel, wet and slippery, they must be sprinkled with **sand,** a large ck of which is kept constantly at the top of the Tunnel to *pply the Break* Waggons.

25. All Breaksmen are expected to take charge of and deliver the Despatch Bags, Parcels, &c., as sent Up and Down the Tunnel; to keep in repair the Endless Ropes, Messengers, and Drag Lines; and whenever *all* the Breaksmen are unavoidably absent from the Bank Head, the large **wooden chock** upon the Down Line, near the Tunnel Mouth, must always be put across the Rails, and a man placed in charge until the return of one of the Breaksmen to relieve him. The Gates to be closed every night before 12 o'clock.

SECTION XIII.

REGULATIONS FOR BANKRIDERS AT THE EUSTON INCLINE.

1. The Bankriders are to have the control, management, and responsibility of the **Inclined Plane** and of the Trains passing down it.

2. The Bankrider is carefully to inspect the condition of every Train, and never attempt to move it until perfectly satisfied of the **sufficiency of the Breaks.**

3. He is not to allow any **Rubbish** or obstruction of any kind to be placed near the Rails on the Incline.

4. He is to pay particular attention to the **Signals** conveyed from Euston to Camden Station.

5. He is also to keep a sharp look-out for any Signal that may be given him to stop his Train on the **descent**, and he must be prepared to bring it to a stand at any time on receiving such Signal.

6. The speed on the Incline must never exceed **10** miles per hour, but a lower speed is necessary when the Train is heavy, or the Rails in bad order.

Section XIV.

BYE-LAWS.

BY VIRTUE of the powers and authorities by an Act of Parliament passed in the Tenth Year of Her Majesty Queen Victoria, intituled "An solidate the London and Birmingham, Grand J Manchester and Birmingham Railway Companies," Railway Clauses Consolidation Act, 1845," ther porated,

We the London and North-Western Railway hereby make the following Bye-Laws:—

1. No Passenger will be allowed to take his Sea any Carriage used on the Railway, or to travel ther said Railway, without having first Booked his place Fare.

2. Each Passenger Booking his place will be furn Ticket, which he is to show when required by t charge of the Train, and to deliver up before leavi pany's Premises upon demand to the Guard or othe the Company duly authorized to collect Tickets.

3. Each Passenger not producing or delivering u will be required to pay the Fare from the place whe originally started.

4. Passengers on the Road Stations will only be ditionally; that is to say, in case there shall be Train for which they are Booked. In case there room for all the Passengers Booked, those Boo longest distance shall have the preference, and those the same distance shall have priority according to which they are Booked.

5. Every person attempting to defraud the Com velling upon the Railway without having previou Fare, or by riding in or upon a Carriage of a supe that for which he has Booked his place, or by co Journey beyond the destination for which he has paid by attempting in any other manner whatever to ev

ment of his Fare, is hereby subjected to a Penalty not exceeding **Forty Shillings.**

6. No Passenger will be allowed to get into, or upon, or to quit any Carriage after the Train has been put in motion; and any person doing so, or attempting to do so, is hereby made liable to a Penalty of **Forty Shillings.**

7. Dogs will be charged for according to distance, but they will on no account be allowed to accompany Passengers in Carriages.

8. Smoking is strictly prohibited both in and upon the Carriages, and in the Company's Stations. Every person Smoking in a Carriage is hereby subjected to a Penalty not exceeding **Forty Shillings;** and every person persisting in smoking in a Carriage or Station after having been warned to desist shall, in addition to incurring a Penalty not exceeding **Forty Shillings,** be immediately, or, if travelling, at the first opportunity, removed from the Company's Premises and forfeit his Fare.

9. Any person found in a Carriage or Station in a state of Intoxication, or committing any Nuisance or wilfully interfering with the comfort of other Passengers, and every person obstructing any Officer of the Company in the discharge of his duty, is hereby subjected to a Penalty not exceeding **Forty Shillings,** and shall immediately, or, if travelling, at the first opportunity, be removed from the Company's Premises, and forfeit his Fare.

10. Any Passenger cutting the Linings, removing or defacing the Number Plates, breaking the Windows, or otherwise wilfully damaging or injuring any Carriage on the Railway, shall forfeit and pay a sum not exceeding **Five Pounds** in addition to the amount of damage done.

Sealed by Order of the Directors.

R. CREED, *Secretary.* (Seal.)

Allowed by the Commissioners of Railways this Twentieth day of August, 1847.

EDWARD STRUTT,
EDWARD RYAN. (Seal.)

two Calendar months, as such Justice shall appoint; such commitment to be determined on payment of the amount of the penalty; and every such penalty shall be returned to the next ensuing Court of Quarter Sessions in the usual manner.

Justices of the Peace empowered to send any case to be tried by the Quarter Sessions.

SECTION 14.]—That (if upon the hearing of any such complaint he shall think fit) it shall be lawful for such Justice, instead of deciding upon the matter of complaint summarily, to commit the person or persons charged with such offence for trial for the same at the Quarter Sessions for the county or place wherein such offence shall have been committed, and to order that any such person so committed shall be imprisoned and detained in any of Her Majesty's gaols or houses of correction in the said county or place in the mean time, or to take bail for his appearance, with or without sureties, in his discretion; and every such person so offending and convicted before such Court of Quarter Sessions as aforesaid (which said Court is hereby required to take cognizance of and hear and determine such complaint) shall be liable in the discretion of such Court to be imprisoned, with or without hard labour, for any term not exceeding two years.

Punishment of Persons Obstructing Railways.

SECTION 15.]—That from and after the passing of this Act, every person who shall wilfully do, or cause to be done, anything in such manner as to obstruct any Engine or Carriage using any Railway, or to endanger the safety of persons conveyed in or upon the same, or shall aid or assist therein, shall be guilty of a misdemeanor, and, being convicted thereof, shall be liable, at the discretion of the Court before which he shall have been convicted, to be imprisoned, with or without hard labour, for any term not exceeding two years.

For Punishment of Persons Obstructing the Officers of any Railway Company, or Trespassing upon any Railway.

SECTION 16.]—That if any person shall wilfully obstruct or impede any Officer or Agent of any Railway Company in the

execution of his duty upon any Railway, or upon or in any of the Stations or other Works or Premises connected therewith; or if any person shall wilfully trespass upon any Railway, or any of the Stations or other Works or Premises connected therewith, and shall refuse to quit the same upon request to him made by any Officer or Agent of the said Company, every such person so offending, and all others aiding and assisting therein, shall and may be seized and detained by any such Officer or Agent, or any person whom he may call to his assistance, until such offender or offenders can be conveniently taken before some Justice of the Peace for the county or place wherein such offence shall be committed, and, where convicted before such Justice as aforesaid (who is hereby authorised and required upon complaint to him upon oath to take cognizance thereof and to act summarily in the premises), shall, at the discretion of such Justice, forfeit to Her Majesty any sum not exceeding 5*l.*, and in default of payment thereof shall or may be imprisoned for any term not exceeding two Calendar months, such imprisonment to be determined on payment of the amount of the penalty.

I,
being this
engaged as
in the service of the London and North-Western Railway Company, do hereby bind myself to observe and obey the foregoing Rules and Regulations, which I have read (or heard read) and understand, and all others that may from time to time be issued for the better government of the Company, so long as I remain a servant in it.

THE END.

London: Printed by WILLIAM CLOWES and S